

LOUISIANA WILDLIFE AND FISHERIES COMMISSION

MEETING MINUTES

February 1, 2018

Al Sunseri
Vice-Chairman

Baton Rouge, Louisiana


3-1-18

The following constitute minutes of the Commission Meeting
and are not verbatim transcripts of the proceedings.

Audio files of the meetings are kept at the
Louisiana Department of Wildlife and Fisheries

2000 Quail Drive

Baton Rouge, Louisiana 70808

For more information, call (225) 763-5775

AGENDA
Louisiana Wildlife and Fisheries Commission
Baton Rouge, Louisiana

February 1, 2018 - 9:30 AM

1. Call to Order
2. Pledge of Allegiance
3. Roll Call
4. Adoption of January 4, 2018 Commission Meeting Minutes
5. Commission Special Announcements/Personal Privilege
6. Enforcement Report January 2018
7. Receive an update on Public Comment relative to the 2018-19 and 2019-20 hunting seasons, 2018-19 general and WMA hunting seasons and rules and regulations, 2019 general and WMA turkey hunting season and rules and regulations, and 2018-19 migratory bird hunting season and rules and regulations
8. Consider amendments to the 2018-19 and 2019-20 hunting seasons, 2018-19 general and WMA hunting seasons and rules and regulations, 2019 general and WMA turkey hunting season and rules and regulations, and 2018-19 migratory bird hunting season and rules and regulations
9. To inform Commission of other 2018-19 Federal public land hunting seasons
10. Update on Louisiana Black Bear Management
11. To Consider the Stock Assessment Report for Striped Mullet
12. Set June 2018 Commission Meeting Date
13. Receive Public Comments
14. Adjournment

MINUTES OF THE MEETING

OF

LOUISIANA WILDLIFE AND FISHERIES COMMISSION

Thursday, February 1, 2018

The regular meeting of the Louisiana Wildlife and Fisheries Commission was Called to Order at 9:30 AM on February 1, 2018, in Baton Rouge, Louisiana at the Louisiana Department of Wildlife and Fisheries Headquarters Building in the Louisiana Room by Vice-Chairman Al Sunseri.

Commissioner Smitko led the Pledge of Allegiance and then Vice-Chairman Sunseri asked everyone to join him in a moment of silence to remember Chairman Samanie on the loss of his father from heart failure.

Vice-Chairman Sunseri asked that agenda item 11 be changed to "Consider the Stock Assessment Report for Striped Mullet" instead of "Receive the Stock Assessment Report for Striped Mullet". Commissioner Smitko made the motion, seconded by Commissioner McPherson and it passed with no opposition.

Vice-Chairman Sunseri asked for the Roll Call. The following Commissioners were present:

Al Sunseri
Chad Courville
Bill Hogan
Joe McPherson
Jerri Smitko
Bart Yakupzack

Chairman Samanie was absent from the meeting.

Secretary Jack Montoucet was also present.

Vice-Chairman Sunseri called for Adoption of January 4, 2018 Commission Meeting Minutes. Commissioner Hogan made a motion to adopt the January 4, 2018 minutes and it was seconded by Commissioner Courville. The motion passed with no opposition.

For Commission Special Announcements/Personal Privilege, Commissioner Carville asked that Mr. Edmond Mouton be remembered

in everyone's thoughts and prayers. Mr. Mouton, a dedicated Department employee for a long time, was having health issues and the prayers for him and his family would be appreciated.

Commissioner McPherson recognized a former colleague and good friend Senator Gerald Long who was attending the meeting.

Vice-Chairman Sunseri asked Secretary Montoucet if he had any announcements. Secretary Montoucet stated a Gulf Council Meeting was currently being held in New Orleans. He noted he attended their reception Tuesday evening and then welcomed attendees to the State of Louisiana Wednesday morning.

Then Secretary Montoucet talked about the Department's new license vendor. He felt the new partner, Sovereign Sportsman Solutions, has proven to be a good partner since the previous contractor did not want to extend their contract to implement a new system. Secretary Montoucet acknowledged the hard work of Ms. Michelle Rayburn and Mr. Alvin Henry along with the new vendor and as of that moment, about 40 licenses had already been sold through the iPhone app. Licenses are being processed in the Headquarters and regional offices as well as through the internet; retail locations will begin selling licenses on April 2nd. Secretary Montoucet further stated that the new system would allow license holders to reprint their licenses throughout the year at no cost, the licenses can be emailed to mobile devices or computers, and in the future boater and hunter education information will be available as well as auto-renewal of your license. Secretary Montoucet then introduced the CEO from Sovereign Sportsman Solutions, Mr. Eric Richey. Mr. Richey began stating his company was commonly known as S3 and then introduced his staff, Chief Operations Officer Bob Ramey and Chief Technology Officer Randall Forsha. He noted they have come across some unique situations in this state which was not uncommon when old vendors were replaced. Mr. Richey then commented that working with the Department staff has been one of the best experiences they have had in the last 10 years. The license system was designed and built by sportsmen and Mr. Richey added they were here for the duration with a long term commitment. Secretary Montoucet advised the Commissioners that if they receive any calls from constituents with problems on the system to be sure to contact either his office or Ms. Rayburn. Commissioner McPherson felt criticism may come from those individuals that missed the News Releases and do not understand their options. Secretary Montoucet advised that Ms. Rayburn has been working and communicating personally with the vendors and she will continue throughout the process.

Then Secretary Montoucet commented that Assistant Secretary Patrick Banks sent a summary of actions from the Gulf Council Meeting. He noted there would be no final action taken on any issue; the Louisiana Only Amendment continued to be debated, the allocation of red snapper among the Gulf States was the most difficult decision to be made but if a decision was made, it would then go to public notice which was a step closer to state management. The charter boats continued to be included in Louisiana's EFP and Assistant Secretary Banks was trying to keep them in the plan. The Gulf Council populated the Ad Hoc Red Snapper/Grouper/Tilefish IFQ Advisory Panel and Mr. Steve Tomeny and Commissioner Smitko were appointed to this panel, pending approval. Amendments 41 and 42 continued to be debated with some wanting it to die and others wanting it to go to a referendum. The EFP received strong and positive feedback and the Secretary anticipated it to be approved. This plan would be for 2 years with the possibility of fine tuning after the first year. Secretary Montoucet commented that the group of people representing Louisiana at the Gulf Council were very well respected and seen as some of the most knowledgeable in the industry. Commissioner Courville asked that a full report from the Gulf Council be given at the next meeting. He added he listened to part of the meeting and if the charter boats were taken out of the EFP, he added another EFP should be drafted to include the charters. Commissioner Courville echoed the good job by Assistant Secretary Banks on "holding the line" on the EFP and Louisiana Only Amendment. He also felt the two other Louisiana Gulf Council Representatives, Camp Matens and Ed Swindell, have done a good job representing Louisiana and hoped they would be reappointed at the appropriate time.

Secretary Montoucet then announced it was a pleasure to introduce a true gentleman, former Chairman of the Senate Natural Resources Committee and now President Pro Tempore Gerald Long from Natchitoches. Senator Long began stating Natchitoches was the oldest settlement in the original Louisiana Purchase and was also known as the "City of Lights". He then noted he was at the meeting to endorse the continuing interest for adding Sterlet sturgeon to the list of domesticated aquatic organisms. Senator Long understood the role of the Commission as he was Chair of the Senate Natural Resources Committee. Continuing on, the Senator stated that 75% of all companies in Louisiana hire 75 or fewer people which makes this state dependent upon small businesses. Senator Long noted there were 3 business people in Natchitoches that were asking for the Commission's support which was previously given. He was also asking for the Commission's support while advocating for small businesses. The Senator knew

of the issues and concerns but he felt there was a greater benefit than the possible risks. He suggested using a sunset provision on this proposal so the company can return before the Commission and prove their reliability. Again, Senator Long advocated the Commission stay the course and give the small business the opportunity to expand and grow. Vice-Chairman Sunseri stated the Commission would take the Senator's comments under advisement. Commissioner Smitko commented to Senator Long she has been a proponent of the Sterlet sturgeon project and was surprised the Legislature held an Oversight Meeting on this issue. She added she was amazed at the suggestion of adding a sunset provision as the company will be expending a large amount of capital and did not think a small company would want to rely on the future members of the Commission or Legislature to continue their business. Senator Long stated that was an excellent point. He further added that the Commission should use whatever reasonable approach needed to make it work.

Captain Edward Skena began the Enforcement Report for January 2018 stating for the month of January there were 4 boating incidents with 2 fatalities and no injuries. Also in January, there were 1,058 written citations, 378 written warnings and 19 public assists. News releases discussed included citing several individuals in Vermilion Parish on migratory game bird violations; a Lettsworth man was cited for killing a Louisiana black bear during a closed season; and 2 individuals were cited in Cameron Parish for using a dredge in a tonging only area.

Vice-Chairman Sunseri then announced the next agenda item, Receive an update on Public Comment relative to the 2018-19 and 2019-20 hunting seasons, 2018-19 general and WMA hunting seasons and rules and regulations, 2019 general and WMA turkey hunting season and rules and regulations, and 2018-19 migratory bird hunting season and rules and regulations would be presented by Mr. Tommy Tuma. Mr. Tuma stated the public comments received were relatively light having a total of 35 e-mails, 2 mails and 1 phone call. The majority of the comments were on the proposed limited access areas on Boeuf and Russell Sage WMAs. Other comments were on the Biloxi WMA vessel restriction, Thistlethwaite WMA deer change and Joyce WMA deer season. (A copy of Mr. Tuma's presentation is included in the Appendices Section of the Minutes.)

Commissioner Courville asked Mr. Tuma to remind him why a limited access area was being added to Russell Sage and Boeuf. Mr. Tuma explained that no motorized vessels would be allowed on portions of Russell Sage and Boeuf WMAs to protect the waterfowl

impoundments. Mr. Tuma then showed a listing of public hearings for the proposed hunting regulations that would be held throughout the state.

Mr. Tommy Tuma also handled the next agenda item, Consider amendments to the 2018-19 and 2019-20 hunting seasons, 2018-19 general and WMA hunting seasons and rules and regulations, 2019 general and WMA turkey hunting season and rules and regulations, and 2018-19 migratory bird hunting season and rules and regulations. Mr. Tuma stated the amendments were to make Deer Area 5 the same as Deer Area 9, adjust the archery season for Deer Area 7, allow the use of gill nets on Spring Bayou WMA, and closing Bussey Brake WMA to all activities including not allowing hunting. However, once the lake on Bussey Brake was full following restoration of the lake bottoms, it may be opened for fishing. The last amendment was to allow a 3-day hunt on Camp Avondale Scout Reservation for boy scouts only. Mr. Tuma concluded stating public comments are still being accepted with another update to be given at the next meeting. (A copy of Mr. Tuma's presentation is included in the Appendices Section of the Minutes.)

General Counsel Yolanda Martin felt a statement should be included that would give the Secretary authority to open Bussey Brake WMA when it was ready. Assistant Secretary Randy Myers felt the Bussey Brake amendment should read that the area was closed to all activities until further notice and at the appropriate time the Secretary could open the area. Mr. Tuma commented that Assistant Secretary Myers' language was to add "until further notice". Mr. Ricky Moses, Director of Fisheries, clarified that Bussey Brake was not full of water since the 1950's pump they inherited was no longer working. Once the new pump was in place and the lake was filled and biologically sound, then the Secretary could give the authority to open the lake. Commissioner Yakupzack asked Mr. Moses if this may happen before next January when rulemaking occurred on hunting regulations and Mr. Moses felt there was a possibility. Commissioner Yakupzack made a motion to accept the amendments as presented with the language on Bussey Brake to read area closed to all activities, no hunting allowed, until further notice. Commissioner McPherson seconded the motion.

Mr. Charles Williams, representing himself and The Wildlife Federation, strongly supported the limited access areas as they have been advocating for measures to handle hunting pressure in various areas. The responsibility to manage the Russell Sage

and Boeuf WMAs well and to account for the disturbance of waterfowl and hunting pressure was clear.

Mr. Joe Macaluso commented that the 2 most populated areas of the state were being eliminated from the public hearings. He suggested that Baton Rouge and New Orleans be included. Vice-Chairman Sunseri agreed with Mr. Macaluso and asked that it be looked at in the future. Commissioner Yakupzack asked Mr. Tuma that when the public hearings were released to the public, remind the sportsmen that they can make public comments at the March 1st Commission Meeting. He suggested adding another meeting in New Orleans to the schedule this year if possible and to make sure one was held there next year. Commissioner McPherson asked Mr. Macaluso, with the comments being received and the opportunities already available, what was the reason for having a specific meeting in Baton Rouge. Mr. Macaluso explained he has been told that sportsmen just cannot take off from their day jobs to come to the Commission Meetings. Assistant Secretary Myers assured everyone that comments would continue to be taken via e-mail or phone. He then reminded the Commission that there have been meetings held in New Orleans but when there were no big issues, there was not a lot of people that attended.

Hearing no further comments, the motion passed with no opposition.

Vice-Chairman Sunseri asked Mr. Tommy Tuma to handle his last item, To inform Commission of other 2018-19 Federal public land hunting seasons. Mr. Tuma stated this presentation was so the public could provide to the Department's federal partners hunting season comments on federal lands. The changes on the federal lands included: the U.S. Army Corps of Engineers will eliminate a 2-day turkey hunt on Indian Bayou and the primitive firearms season on Old River Lock and Control Structure will be for bucks only; Barataria Preserve within the National Park Service listed several administrative changes as well as adding a shotgun season for feral hogs; the U.S. Forest Service Kisatchie National Forest added a primitive firearms hunt after the modern firearm season; the elimination of taking raccoon and opossum was the only change on the U.S. Fish and Wildlife Service Delta NWR property. Again, Mr. Tuma stated the Department will accept public comments during the public hearings and at the March and April Commission Meetings. (A copy of Mr. Tuma's presentation is included in the Appendices Section of the Minutes.)

Commissioner McPherson asked if the Department was just taking comments on the federal seasons on behalf of its federal partners. Mr. Tuma stated the Department works closely with those partners and make recommendations which do fall within the season framework.

Update on Louisiana Black Bear Management to be handled by Ms. Maria Davidson was the next agenda item announced by Vice-Chairman Sunseri. Ms. Davidson began stating the black bear was delisted from the Endangered Species list in April of 2016. The Fish and Wildlife Service wants to monitor the black bear since the delisting to ensure the species does not decline and require further protection. The monitoring plan was written by the U.S. Fish and Wildlife Service with input from the Department. The agreed upon plan will be for 7 years, 5 years as mandated by the Endangered Species Act plus another 2 since bears are slow reproductive animals. Ms. Davidson then discussed the response triggers which were divided into 3 categories. The 3 categories are based on population vital rates, habitat and new or increasing threats to the species. The goal of category 1 was for the bear to meet the same standards now as it was when it was delisted which was a 95% chance of persistence over 100 years. To find out if this chance of persistence has occurred, staff looks at the change in population size, survival and recruitment. Adult female survival was the single thing most closely related to whether or not the 95% chance of persistence has been met and that number has to be greater than 90%. The Department was responsible for monitoring the population data and will continue with the hair snare collection in Tensas and Upper Atchafalaya for all 7 years. Also staff will repeat a hair snare project in Three Rivers Complex either in 2019 or 2020. Live trapping and den checks will occur in each of the 7 years. In January 2015, Ms. Davidson mentioned a management plan was developed with the objective being to "maintain a sustainable black bear population in suitable habitat for the benefit of the species and Louisianans". She then discussed how the management objective would be reached through the 3 overarching activities that included education, human/bear conflict and harvest. The education activity involved providing information on the BearWise.org website, holding teacher workshops and having a traveling library display. Staff responds to human/bear conflicts both proactively and reactively through education, conflict response and by training local law enforcement departments as well as Department biologists. In the management plan, the state of Louisiana was divided into 7 bear management areas so impacts from one area may not influence those in other areas. Ms. Davidson continued noting the first

and second PDM reports have been submitted to the U.S. Fish and Wildlife Service for their input to be added and then posted on the Service's website. Results of the reports indicate that Tensas River Basin has met that benchmark of .936 for female survival but the population has "plateaued out". The Three Rivers Complex resulted from relocating 48 females with 104 cubs from 2000 through 2009. In 2013, a hair snare project was done to get a population baseline. The Upper Atchafalaya populations are monitored on a yearly basis and the female survival was very high. The Lower Atchafalaya population numbers were from a master's study that have not been updated since 2013. Other monitoring activities include calls received at the Department offices due to a complaint, a sighting or a dead bear. Ms. Davidson concluded her presentation stating that the PDM reports have met the specifics for Category 1 and the bear population was doing well. (A copy of Ms. Davidson's presentation is included in the Appendices Section of the Minutes.)

Commissioner McPherson asked with the female survivability high, why would the populations plateau and Ms. Davidson commented that once an area reaches its carrying capacity, the bears will wander outside the area and not be included in a sample. Then Commissioner McPherson assumed the population was growing at the same or greater rate but they were not being sampled since it's not in the same area and asked if there was nothing being done to determine what is the expanded population. Ms. Davidson explained that new methods are being sought by Tennessee professor, Dr. Clarke, but the Department will have to determine whether the cost associated with those new methods are necessary and feasible. Commissioner Smitko asked if DNA was being tested from the hair snare samples and Ms. Davidson answered yes and noted this method was much cheaper and quicker and more samples could be obtained. Commissioner Smitko asked if correspondence could be sent to the District Attorney's office in the parish where the bear was killed asking that the Commission and Department be notified if any plea offers were made. Col. Sammy Martin stated he would take care of that request. Commissioner Courville asked when did the 7 years for the recovery plan start and Ms. Davidson answered it started April of 2016. The Commissioner asked what happens at the end of year 7, does the sampling or funding change. Ms. Davidson stated that the funding remains the same since the U.S. Fish and Wildlife Service does not provide monies for bear monitoring and to say what may happen was not possible since the bear populations change each year. She added that Louisiana has a broader and deeper data base on the bear population than most states. Commissioner Courville asked what was the limiting factor in

determining female survival rates on all areas and he was told it was not necessary for post delisting monitoring. Ms. Davidson added that the 2 subpopulations in the Upper Atchafalaya and Tensas areas were used in justifying delisting the bear and thus the reason for checking them every year. Commissioner Courville wondered if there was a mechanism to have the bear display put into schools and Ms. Davidson mentioned the display has been very popular and she would love to have a second one. Going on, Commissioner Courville asked what constitutes a sexually mature adult and was told it was a 3-4-year-old bear. Commissioner Courville asked about funding for this project and he was told funding came from the P-R Act. He then asked if the 2 populations with female survivability could sustain a bear harvest. Ms. Davidson noted this has been the goal over the past several years and it was desired to continue to work towards that goal. A public attitude survey was conducted in 2013 and Ms. Davidson hoped to repeat the survey soon. The results from a third party, unbiased group to give the Department the public's attitude on bears, bear management, potential for a harvest was important in guiding future decisions. Commissioner Courville asked Ms. Davidson to let the Commission know what one illegally harvested bear such as that which recently occurred meant in jeopardizing the female survivability in the grand scheme of things. He then asked what type of guidance can be given hunters when interacting with bears. Ms. Davidson stated the most effective way for a deer hunter to avoid bear conflict was to stop baiting with corn and rice bran and use raw soybeans instead which was not palatable to bears. The second effective way to avoid conflict was to carry bear spray. Commissioner Courville asked that examples of bear spray be posted on the website and he then asked if there has been any correspondence on the possibility of a group suing the U.S. Fish and Wildlife Service on the delisting of bears. Ms. Davidson answered that was being handled at the Solicitor's level in Atlanta and Washington. Commissioner Courville suggested sending a formal request to the Service asking that updates be given on this potential lawsuit to the Department.

Vice-Chairman Sunseri asked Mr. Jason Adriance to come forward for his agenda item, To Consider the Stock Assessment Report for Striped Mullet. Mr. Adriance began thanking Mr. Joe West for putting the report together. He added that this was an annual report, no changes have occurred since last year, and the stock was still healthy. Mr. Adriance asked for the Commission's approval so it could be transmitted to the Legislature. Hearing no comments, Commissioner Courville made a motion to accept the Report and it was seconded by Commissioner Hogan. The motion

passed with no opposition. (A copy of the Stock Assessment Report for Striped Mullet is included in the Appendices Section of the Minutes.)

Commissioner Courville made a motion to the Set June 2018 Commission Meeting Date as June 7, 2018 beginning at 9:30 AM and it was seconded by Commissioner Smitko. She then asked if the Commission would continue having meetings around the state this year. Commissioner Yakupzack noted for 3 years in a row, two meetings have been held in satellite areas and felt it was a good goal to stay with for 2018. Commissioner McPherson asked that a list of Commission meetings held outside of Baton Rouge be sent to the Commissioners. The motion passed with no opposition.

Vice-Chairman Sunseri then asked for Public Comments.

Mr. John Coulon, Delta Blue Sport Fishing, Inc., stated his boat was considered by the National Marine Fisheries Service as a head boat but he felt it should be listed as a party boat. He added that his boat can hold up to 20 passengers and was only 1 of 2 of these type boats left along Louisiana's coast that offers fishing opportunities. Vice-Chairman Sunseri recommended that Mr. Coulon contact and get involved with the newly created Finfish Task Force.

Before adjournment, Secretary Montoucet announced that Commissioner Smitko and Mr. Steve Tomeny were approved to be on the Gulf Council's IFQ Advisory panel.

Commissioner Smitko made a motion for Adjournment, it was seconded by Commissioner Courville and unanimously approved.

APPENDICES



2018 Summary of Public Comment for Conditionally Approved NOI

Tommy Tuma | LDWF Commission Meeting | 02/01/2018

Public Comments to Date for NOI

- **Comments via email, mail, phone call:**
 - 38 (35 email, 2 mail, 1 call)
 - 29 related to proposed changes
- **Total Comments Related to Proposed Changes:**
 - LAAs on Boeuf and Russell Sage: 5 in support, 11 opposed, 2 inquiries
 - Biloxi vessel restriction: 0 in support, 6 opposed, 2 neutral
 - Thistlethwaite deer season change: 1 in support
 - Drone use on WMAs: 1 opposed
 - Joyce WMA deer season: 1 opposed



Public Hearings

Feb. 20 (Tuesday) at 6 p.m. Minden, LA, at the LDWF Minden Office, 9961 Hwy 80, Minden

Feb. 23 (Friday) at 6 p.m. at the LSU Ag Center Building, 7101 Gulf Highway, Lake Charles;

Feb. 26 (Monday) at 6 p.m. at the Ponchatoula High School Library, 19452 Hwy 22, Ponchatoula

February 27 (Tuesday) at 6 p.m. at the Alexandria Convention Hall, 915 3rd St., Alexandria

February 28 (Wednesday) at the USGS Wetland and Aquatic Research Center, 700 Cajundome Blvd., Lafayette

March 1 (Thursday) at the LDWF Monroe office, 368 CenturyLink Drive, Monroe, LA 71203

Public comment will be accepted at LWFC monthly meetings from now through March 1 or may be submitted directly to Tommy Tuma, LDWF Wildlife Division, PO Box 98000, Baton Rouge, LA 70898-9000, phone 225-765-2349 or via email ttuma@wlf.la.gov



**Public Comments Related to the NOI
January 5-- February 1, 2018**

<u>Date</u>	<u>Topic</u>	<u>Contact</u>	<u>Communication</u>	<u>For</u>	<u>Against</u>	<u>Other</u>
18-Jan	Area 2 deer season	Randy Fontenot	email			would like to request Evangeline parish be moved from Area 2 to Area 6 would like to see more handicap ATV trails on Sandy Hollow WMA
9-Jan	ATV use	Steve Dauzat	email			fisherman that is opposed to this
8-Jan	Biloxi vessel length restriction	Joseph Lamy	email	x		thinks ban is to prohibit public use of waterways
8-Jan	Biloxi vessel length restriction	Thomas Brunell	email	x		thinks LDWF is trying to block access to the waterways
8-Jan	Biloxi vessel length restriction	Mike Gozaies	email	x		believes the ban is a ban on overnight boats, once clarified, he was not concerned
9-Jan	Biloxi vessel length restriction	Chuck Roger	email			believes this ban is an infringement on his
9-Jan	Biloxi vessel length restriction	Nick Derbes	email	x		believes LWDF should stop bowing to the landowner and let this WMA go
9-Jan	Biloxi vessel length restriction	Matt Reitzell	email	x		wanted clarification about proposal, did not indicate position
10-Jan	Biloxi vessel length restriction	Brian Holmes	email			opposes; does not believe that large vessels cause damage
13-Jan	Biloxi vessel length restriction	Eric Beier	email	x		supports Antler Restrictions for deer
11-Jan	Deer Season	Jake Pearis	email			wants LWDF to regulate helicopter and aerial scouting
8-Jan	Drones	Charlie Maraist	email	x		indicates that he will lose hunting opportunity
8-Jan	Joyce deer season	Bandon Campbell	email	x		things electronic calling and persons carrying multiple guns are issues with waterfowl hunting
8-Jan	LAA on Boeuf	David Kincaid	email	x		has invested a lot of time and money in gear and boats
8-Jan	LAA on Boeuf	Daniel Jones	email	x		believes the proposal is stupid
8-Jan	LAA on Boeuf	Jeffrey Fuller	email	x		Believes the site is not suitable for LAA
9-Jan	LAA on Boeuf	Logan Cooper	email	x		wanted clarification about proposal, did not indicate position
5-Jan	LAA on Russell Sage and Boeuf	Kevin Epoinette	email			indicates that he is an older gentlemen that can't get around like he used to
5-Jan	LAA on Russell Sage and Boeuf	Guy Bell	email	x		indicates shell limitations and noon closure would be better than LAA
8-Jan	LAA on Russell Sage and Boeuf	Jesse Hall	email	x		

8-Jan LAA on Russell Sage and Boeuf	Floyd Pate	email		x
9-Jan LAA on Russell Sage and Boeuf	Michael Krickel	email		
8-Jan LAA on Russell Sage and Boeuf	Jacob Hendrix	phone		x
29-Jan LAA on Russell Sage and Boeuf	Charles Williams	email	x	
29-Jan LAA on Russell Sage and Boeuf	Fred Borel	email	x	
29-Jan LAA on Russell Sage and Boeuf	Mark Shurtz	email	x	
10-Jan LAA on Russell Sage and Boeuf	Jack Hall	email		x
10-Jan LAA on Russell Sage and Boeuf	Andrew Thompson	email		x
10-Jan LAA on Russell Sage and Boeuf	Barbara Hall	email		x
29-Jan LAA's on state owned WMA's	Jay Huner	email	x	
29-Jan LAA's on state owned WMA's	Marty Floyd	email	x	
14-Jan LAA's on state owned WMA's	Paul Taylor	email	x	
14-Jan Pass A Louvre deer season	Paul Taylor	email		
10-Jan Pointe Aux Chenes WMA deer season	Marie Chasson	mail		
14-Jan state deer season	Gervis Roberie	email		
8-Jan Thistlethwaite deer season	Darrell Oliver	mail	x	

out of state hunter that says he will not buy license if this passes

wanted clarification about proposal, did not indicate position

opposed as it is proposed, supports doing away with mud motors

believes misuse of mud motors cause excessive disturbance to waterfowl

strongly supports

supports due to reduction of noise and pressure from constant use of mud motors and damage to water bodies that occur from use of mud motors

does not support

does not support

believes this limits opportunity for youths

supports because he believes that LAAs reduce harassment

supports because he believes that LAAs reduce harassment

supports addition of more LAAs on WMAs

would like to see elimination of gun and crossbows for allowable means

would like to see more deer season on Pointe Farm unit

would like to see a reduction in deer limits and season length

would like to see either sex days in Jan or at least a bucks only in Jan



2018 Amendment to Hunting Seasons and WMA Rules and Regulations Notice of Intent

Tommy Tuma | Louisiana Wildlife & Fisheries Commission Meeting |
February 1, 2018

NOI Amendments

Resident Game Hunting Season (LAC 76:XIX.101 and 103)

**General and Wildlife Management Area Hunting Rules and
Regulations (LAC 76:XIX.111)**



Resident Game Hunting Season (LAC 76:XIX.101, 103)



LAC 76:XIX.103.C Deer Area Schedules

Change in season structure for Deer Area 5, proposed dates will occur earlier within normal season framework to facilitate antlerless harvest earlier in the season. Intent to improve sex ratios in advance of breeding while reducing pressure on available food resources earlier in the season.

Area	Archery	Primitive Firearms	Still Hunt	With or Without Dogs
	<p>OPENS: 1st day of Oct.</p> <p>CLOSES: Feb. 15</p> <p>(1st 15 days are BUCKS ONLY)</p>	<p>OPENS: 2nd Set of Nov.</p> <p>CLOSES: Fri. before 2nd Set of Nov. (BUCKS)</p> <p>GALE:</p> <p>OPENS: Mon. after the next to last Set of Jan.</p> <p>CLOSES: Last day of Jan. (Bucks-SEX SET-3 GALE)</p> <p>MAKES ONLY FOR REMAINDER OF SEASON</p> <p>SEE EITHER SEX EXCEPT as noted</p> <p>OPENS: 2nd Set of Nov.</p> <p>CLOSES: Fri. before 1st Set of Nov.</p> <p>OPENS: Mon. after next to last Sunday of Jan.</p> <p>Bucks Only</p> <p>CLOSES: Last Day of Jan. Bucks Only</p>	<p>OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sets. In Nov., then it will open on the 2nd Set. of Nov.</p> <p>CLOSES: Fri. before 2nd Set. of Dec. EXCEPT when there are 5 Sets. In Nov. and then it will close on the Fri. before the 1st Set. of Dec.</p> <p>(BUCKS ONLY UNLESS EITHER SEX SEASON IS IN PROGRESS)</p> <p>OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sets. In Nov., then it will open on the 2nd Set. of Nov.</p> <p>CLOSES: Sunday of the same weekend, EITHER SEX</p> <p>OPENS: Fri. after Thanksgiving Day</p> <p>CLOSES: Sun. after Thanksgiving day. (EITHER SEX)</p>	<p>OPENS: 2nd Set. of Dec. EXCEPT when there are 5 Sets. In Nov., then it will open on the 1st Set. of Dec.</p> <p>CLOSES: Next to last Sun. of Jan. (BUCKS ONLY UNLESS EITHER SEX SEASON IS IN PROGRESS)</p> <p>OPENS: 2nd Set. of Dec.</p> <p>CLOSES: Sun. after 2nd Set. of Dec. (EITHER SEX)</p> <p>SEX:</p> <p>OPENS: Sat. before Christmas</p> <p>CLOSES: Sun. before Christmas (EITHER SEX)</p> <p>CLOSES: Sun. after Christmas (BOTH SEX-48H)</p> <p>OPENS: 3rd Set. of Jan.</p> <p>CLOSES: Sun. after 2nd Set. in Jan. (EITHER SEX)</p> <p>GALE</p>



LAC 76:XIX.103.C Deer Area Schedules

Change in season structure for Deer Area 7. The adjustment will allow the Archery season to run concurrent with Deer Areas 3, 8 & 10. All 4 areas share the same opening date of primitive firearm and modern firearm season. The change will add consistency in season dates between the areas. Area 7 along with Areas 3, 8 & 10 have October breeding.

Area	Archery	Primitive Firearms	Still Hunt	With or Without Dogs
7	OPENS: 1st day of Oct. CLOSES: Last day of Jan. OPENS: 3RD Sat. of Sept. CLOSES: Jan. 15	OPENS: 2nd Sat. of Oct. CLOSES: Fri. before 3rd Sat. of Oct. OPENS: 1st Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Nov.	OPENS: 3rd Sat. of Oct. CLOSES: Fri. Before 1st Sat. of Nov. OPENS: 2nd Sat. of Nov. CLOSES: Sun. after Thanksgiving	OPENS: Mon. after Thanksgiving Day CLOSES: After 35 days



General and Wildlife Management Area Hunting Rules and Regulations (LAC 76:XIX.111)



LAC 76:XIX.111.G.10.c
Spring Bayou WMA

c. Commercial Fishing. Permits are required of all commercial fishermen using Grassy Lake, Pomme de Terre and Spring Bayou WMAs. ~~Gill nets or trammel nets and the take or possession of grass carp are prohibited on Spring Bayou WMA.~~



LAC 76:XIX.111.G.17.ss
Spring Bayou WMA

v. Commercial Fishing: Gill nets and trammel nets 3.5 inches and greater permitted Monday through Friday EXCEPT slat traps and hoop nets permitted any day. ~~and EXCEPT gill or trammel nets or the take or possession of grass carp are prohibited.~~ The take and possession of grass carp is prohibited. Permits available from area supervisor or Opelousas Wildlife Field Office. CLOSED until after 2 p.m. during waterfowl season.



LAC 76:XIX.111.G.17.yy
Bussey Brake WMA

Area Closed to all activities. No hunting allowed.

LAC 76:XIX.111.F.18
Other Areas

18. Other Areas

a. Camp Avondale Scout Reservation

i. Deer

(a). Firearms Either-sex: 2nd Sat. in November for 3

days. Restricted to scout program.



Public Hearings and Public Comments

- Public Comments will be accepted through 9:00 pm, March 1, 2018.
- All comments can be provided to:

Tommy Tuma
2000 Quail Drive
Baton Rouge, LA 70898
ttuma@wlf.la.gov
225-765-2349



NOTICE OF INTENT

Department of Wildlife and Fisheries Wildlife and Fisheries Commission

Notice is hereby given that the Wildlife and Fisheries Commission proposes to amend the general and wildlife management area rules and regulations for the 2018-2019 season, the resident game hunting season for the 2018-2020 hunting seasons, the general and wildlife management area rules and regulations for the turkey season, the turkey hunting areas, and seasons, and bag limits for the 2019 turkey season, and the migratory bird seasons, regulations, and bag limits for the 2018-2020 hunting season.

Title 76

WILDLIFE AND FISHERIES

Part XIX. Hunting and WMA Regulations

Chapter 1. Resident Game Hunting Season

§101. General

A. The resident game hunting season regulations have been adopted by the Wildlife and Fisheries Commission. A complete copy of the regulations pamphlet may be obtained from the department.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:115.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 21:707 (July 1995), amended LR 22:585 (July 1996), LR 23:871 (July 1997), LR 24:1324 (July 1998), LR 25:1290 (July 1999), LR 26:1506 (July 2000), LR 27:1061 (July 2001), LR 28:1615 (July 2002), LR 29:1122 (July 2003), LR 30:1493 (July 2004), LR 31:1627 (July 2005), LR 32:1253 (July 2006), LR 33:1399 (July 2007), LR

34:1447 (July 2008), LR 35:1278 (July 2009), LR 36:1580 (July 2010), LR 37:2206 (July 2011),
 LR 38:1747 (July 2012), LR 39:2307 (August 2013), LR 40:1534 (August 2014), LR 41:958
 (May 2015), LR 42:1107 (July 2016), LR 44: .

§103. Resident Game Birds and Animals

- A. Shooting Hours—one-half hour before sunrise to one-half hour after sunset.
- B. Consult Regulation Pamphlet for Seasons or Specific Regulations on Wildlife

Management Areas or Specific Localities

Species	Season Dates	Daily Bag Limit	Possession Limit
Quail	OPENS: 3rd Saturday of November CLOSES: Last Day of February	10	30
Rabbit and Squirrel	OPENS: 1st Saturday of October CLOSES: Last Day of February	8	24
Squirrel*	OPENS: 1st Saturday of May for 23 days	3	9
Deer <u>2017-2019</u> <u>2018-2020</u>	See Schedule	1 antlered and 1 antlerless	Deer Areas 1,2,3,5,6,7,8, and 9 6/season (not to exceed 3 antlered deer or 4 antlerless deer). Deer Area 4 limit

Species	Season Dates	Daily Bag Limit	Possession Limit
		(when legal)	3/season (not to exceed 2 antlered or 2 antlerless deer). Deer Area 10 limit 3/season (not to exceed 2 antlered or 2 antlerless deer).

*NOTE: Spring squirrel season is closed on the Kisatchie National Forest, National Wildlife Refuges, U.S. Army Corps of Engineers property. Some state wildlife management areas will be open, check WMA season schedule.

C. Deer Hunting Schedule ~~2017-2018~~ 2018-2019

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
1	OPENS: 1st day of Oct. CLOSES: Last day of Jan.	OPENS: 2nd Sat. of Nov. CLOSES: Fri. after 2nd Sat. of Nov. OPENS: Mon. after the next to last Sun. of Jan. CLOSES: Last day of Jan.	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Dec.	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec. CLOSES: Sun. after 1st Sat. of Jan.

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
		CLOSES: Last day of Jan.	CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec. OPENS: Mon. after 1st Sat. of Jan. CLOSES: next to last Sun. of Jan.	CLOSES: Sun. after 1st Sat. of Jan.
5	OPENS: 1st day of Oct. CLOSES: Feb. 15 (1st 15 days are BUCKS ONLY)	OPENS: 2nd Sat. of Nov. CLOSES: Fri. before 3rd Sat. of Nov. (BUCKS ONLY) OPENS: Mon. after the next to last Sun. of Jan. CLOSES: Last day of Jan. (EITHER SEX 1ST	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec. CLOSES: Next to last Sun. of Jan. (BUCKS ONLY UNLESS EITHER SEX

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
		<p>7 DAYS, BUCKS ONLY FOR REMAINDER OF SEASON [All Either Sex except as noted.] OPENS: 2nd Sat. of Nov. CLOSES: Fri. before 3rd Sat. of Nov. OPENS: Mon. after next to last Sun. of Jan. Bucks Only CLOSES: Last day of Jan.</p>	<p>5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec. (BUCKS ONLY UNLESS EITHER SEX SEASON IS IN PROGRESS) OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. In Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Sun. of the same weekend. EITHER SEX OPENS: Fri. after Thanksgiving Day.</p>	<p>SEASON IS IN PROGRESS OPENS: 2nd Sat. of Dec. CLOSES: Sun. after 2nd Sat. of Dec. EITHER SEX OPENS: Sat. before Christmas. CLOSES: Sun. before Christmas (EITHER SEX). OPENS: Sat. after Christmas. CLOSES: Sun. after Christmas. (EITHER SEX) OPENS: 2nd Sat. in Jan.</p>

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
			CLOSES: Sun. after Thanksgiving day. EITHER SEX	CLOSES: Sun. after 2nd Sat. in Jan. EITHER SEX
6	OPENS: 1st day of Oct. CLOSES: Feb. 15 (1st 15 days are BUCKS ONLY)	OPENS: 2nd Sat. of Nov. CLOSES: Fri. before 3rd Sat. of Nov. OPENS: Mon. after the next to last Sun. of Jan. CLOSES: Last day of Jan.	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec.	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec. CLOSES: Next to last Sun. of Jan.
7	OPENS: 1st day of Oct.	OPENS: 2nd Sat. of Oct. CLOSES: Fri. before 3rd Sat. of Oct. OPENS: 1st Sat. of Nov.	OPENS: 3rd Sat. of Oct. CLOSES: Fri. before 1st Sat. of Nov. OPENS: 2nd Sat of Nov.	OPENS: Mon. after Thanksgiving Day CLOSES: After 35 days

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
	CLOSES: Last day of Jan. OPENS: 3rd Sat. of Sept. CLOSES: Jan. 15.	CLOSES: Fri. before 2nd Sat. of Nov.	CLOSES: Sun. after Thanksgiving	
8	OPENS: 3rd Sat. of Sept. CLOSES: Jan. 15	OPENS: 2nd Sat. of Oct. CLOSES: Fri. before 3rd Sat. of Oct. OPENS: Mon. after Thanksgiving Day CLOSES: Fri. before 1st Sat. of Dec.	OPENS: 3rd Sat. of Oct. CLOSES: Sun. after Thanksgiving Day.	OPENS: 1st Sat. of Dec. CLOSES: After 37 days.
9	OPENS: 1st day of Oct. CLOSES: Feb. 15	OPENS: 2nd Sat. of Nov. CLOSES: Fri. before 3rd Sat. of Nov. (BUCKS ONLY)	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov.	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec.

D. Deer Hunting Schedule ~~2018-2019~~ 2019-2020

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
1	OPENS: 1st day of Oct. CLOSES: Last day of Jan.	OPENS: 2nd Sat. of Nov. CLOSES: Fri. after 2nd Sat. of Nov. OPENS: Mon. after the next to last Sun. of Jan. CLOSES: Last day of Jan.	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec. OPENS: Mon. after 1st Sat. of Jan. CLOSES: next to last Sun. of Jan.	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec. CLOSES: Sun. after 1st Sat. of Jan.
2	OPENS: 1st day of Oct.	OPENS: Next to last Sat. of Oct.	OPENS: Last Sat. of Oct.	OPENS: Wed. before the 2nd Sat. of Dec. in

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
			CLOSES: next to last Sun. of Jan.	
5	OPENS: 1st day of Oct. CLOSES: Feb. 15 (1st 15 days are BUCKS ONLY)	OPENS: 2nd Sat. of Nov. CLOSES: Fri. before 3rd Sat. of Nov. (BUCKS ONLY) OPENS: Mon. after the next to last Sun. of Jan. CLOSES: Last day of Jan. (EITHER SEX 1ST 7 DAYS, BUCKS ONLY FOR REMAINDER OF SEASON) (All Either Sex except as noted.) OPENS: 2 nd Sat. of Nov. CLOSES: Fri. before 3 rd Sat. of Nov.	OPENS: Sat. before Thanksgiving Day EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec. (BUCKS ONLY UNLESS EITHER SEX SEASON IS IN PROGRESS)	OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec. CLOSES: Next to last Sun. of Jan. (BUCKS ONLY UNLESS EITHER SEX SEASON IS IN PROGRESS) OPENS: 2nd Sat. of Dec. CLOSES: Sun. after 2nd Sat. of Dec. (EITHER SEX) OPENS: Sat. before Christmas.

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
		<p>OPENS: Mon. after next to last Sun. of Jan. Bucks Only</p> <p>CLOSES: Last day of Jan.</p>	<p>OPENS: Sat. before Thanksgiving Day</p> <p>EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov.</p> <p>CLOSES: Sun. of the same weekend.</p> <p>EITHER SEX:</p> <p>OPENS: Fri. after Thanksgiving Day.</p> <p>CLOSES: Sun. after Thanksgiving day.</p> <p>EITHER SEX</p>	<p>CLOSES: Sun. before Christmas.</p> <p>OPENS: Sat. after Christmas.</p> <p>CLOSES: Sun. after Christmas. (EITHER SEX)</p> <p>OPENS: 2nd Sat. in Jan.</p> <p>CLOSES: Sun. after 2nd Sat. in Jan.</p> <p>(EITHER SEX)</p>
6	<p>OPENS: 1st day of Oct.</p> <p>CLOSES: Feb. 15</p>	<p>OPENS: 2nd Sat. of Nov.</p> <p>CLOSES: Fri. before 3rd Sat. of Nov.</p> <p>OPENS: Mon. after the next to last Sun. of Jan.</p>	<p>OPENS: Sat. before Thanksgiving Day</p> <p>EXCEPT when there are 5 Sats. in Nov., then it will open on the 3rd Sat. of Nov.</p>	<p>OPENS: 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov., then it will open on the 1st Sat. of Dec.</p>

Area	Archery	Primitive Firearms (All Either Sex Except as Noted)	Still Hunt (No dogs allowed)	With or Without Dogs
	(1st 15 days are BUCKS ONLY)	CLOSES: Last day of Jan.	CLOSES: Fri. before 2nd Sat. of Dec. EXCEPT when there are 5 Sats. in Nov. and then it will close on the Fri. before the 1st Sat. of Dec.	CLOSES: Next to last Sun. of Jan.
7	OPENS: 1st day of Oct. CLOSES: Last day of Jan. OPENS: 3rd Sat. of Sept. CLOSES: Jan. 15.	OPENS: 2nd Sat. of Oct. CLOSES: Fri. before 3rd Sat. of Oct. OPENS: 1st Sat. of Nov. CLOSES: Fri. before 2nd Sat. of Nov.	OPENS: 3rd Sat. of Oct. CLOSES: Fri Before 1st Sat. of Nov. OPENS: 2nd Sat of Nov. CLOSES: Sun. after Thanksgiving	OPENS: Mon. after Thanksgiving Day CLOSES: After 35 days
8	OPENS: 3rd Sat. of Sept. CLOSES: Jan. 15	OPENS: 2nd Sat. of Oct. CLOSES: Fri. before 3rd Sat. of Oct.	OPENS: 3rd Sat. of Oct. CLOSES: Sun. after Thanksgiving Day.	OPENS: 1st Sat. of Dec. CLOSES: After 37 days.

c. Commercial Fishing. Permits are required of all commercial fishermen using Grassy Lake, Pomme de Terre and Spring Bayou WMAs. ~~Gill nets or trammel nets and the take or possession of grass carp are prohibited on Spring Bayou WMA.~~ Drag seines (except minnow and bait seines) are prohibited except experimental bait seines allowed on Dewey Wills WMA north of LA 28 in Diversion Canal. Commercial fishing is prohibited during regular waterfowl seasons on Grand Bay, Silver Lake and Lower Sunk Lake on Richard K. Yancey WMA. Commercial fishing is prohibited on Salvador/Timken, ~~Ouachita and~~ Pointe-aux-Chenes, ~~and Russell Sage~~ WMAs except commercial fishing on Pointe-aux-Chenes is allowed in Cut Off Canal and Wonder Lake. No commercial fishing activity shall impede navigation and no unattended vessels or barges will be allowed. Non-compliance with permit regulations will result in revocation of commercial fishing privileges for the period the license is issued and one year thereafter. Commercial fishing is allowed on Pass-a-Loutre and Atchafalaya Delta WMAs. See Pass-a-Loutre for additional commercial fishing regulations on mullet.

11. WMAs Basic Season Structure. For season dates, bag limits, shooting hours, special seasons and other information consult the annual regulations pamphlet for specific details.

12. Resident Small Game (squirrel, rabbit, quail, mourning dove, woodcock, snipe, rail and gallinule). Same as outside except closed during modern firearm either-sex deer seasons on certain WMAs (see WMA schedule) and except non-toxic shot, size 6 or smaller must be used for dove, rail, snipe, and gallinule. Unless otherwise specified under a specific WMA hunting schedule, the use of dogs for rabbit and squirrel hunting is prohibited. Spring squirrel season with or without dogs: first Saturday of May for nine days. Consult regulations pamphlet for specific WMAs.

ix. Rifle and Pistol Range open daily. Skeet ranges open by appointment only, contact Hunter Education Office, telephone 225-765-2931. No trespassing in restricted areas behind ranges.

Note: Atchafalaya National Wildlife Refuge and U.S. Army Corps of Engineers land holdings adjacent to the Sherburne Wildlife Management Area will have the same rules and regulations as Sherburne WMA. No hunting or trapping in restricted area.

x. Bird Dog Training Area: Open to bird dog training all year EXCEPT CLOSED during either-sex modern firearm hunts for deer, WMA turkey season, and opening weekend of 1st and 2nd segments of dove season.

rr. Soda Lake. Bicycles allowed. Vehicle parking allowed only in designated parking area on LA 173 at Twelve Mile Bayou and LA 169 adjacent to levee. All trapping and hunting prohibited EXCEPT:

i. Deer

(a). Archery Only, Oct. 1-Jan. 31, either-sex.

ii. Small Game: Portion West of Twelve Mile Bayou same as outside, falconry only and open to squirrel hunting during the spring season, 1st Sat. of May for 9 days, Falconry only. Portion east of Twelve Mile Bayou open same as outside. Beagles allowed for rabbits and dogs allowed for squirrel ~~1st Sat. of Jan.~~ Sat. before Christmas to end of Feb. Open to squirrel hunting during the spring season, 1st Sat. of May for 9 days, with or without dogs.

ss. Spring Bayou. Area Closed: Last Sat. of Oct. for 2 days to all EXCEPT Youth Deer Hunters. No hunting allowed in Headquarters area. Only overnight campers allowed in the improved Boggy Bayou Camping area. Rules and Regulations posted at

campsite. A fee is assessed for use of this campsite. Water skiing permitted only in Old River and Grand Lac.

i. Deer

- (a). Archery: Oct. 1-15 bucks only, Oct. 16-Feb. 15
either sex.
- (b). Youth: Last Sat. of Oct. for 2 days, either-sex.
- (c). Firearms Either-sex: Fri. after Thanksgiving Day,
Mandatory Deer Check, Sat. after Thanksgiving Day for 2 days, Self-Clearing Permit.
- (d). Firearms Bucks Only: 4th Sat. of Dec. for 16 days.
- (e). Primitive Firearms: Mon. after close of Firearms
Bucks only for 7 days.

ii. Turkey

- (a). Youth Lottery: 4th Sat. of April for 2 days.

iii. Small Game & Waterfowl: Same as outside EXCEPT small
game CLOSED during either-sex firearms hunts for deer. Waterfowl to remain open during
either-sex firearms hunts for deer. Open to squirrel hunting during the spring season, 1st Sat. of
May for 9 days, with or without dogs. Beagles allowed for rabbits and dogs allowed for squirrel
hunting day after primitive firearms season ends to last day of Feb.

- (a). Youth Squirrel Hunt: 4th Sat. of Sept. for 2 days.

iv. Raccoon (Nighttime): 2nd Sat. of Sept. for 16 days and day
after primitive firearms season ends to last day of Feb.

v. Commercial Fishing: Gill nets and trammel nets 3.5 inches

and greater permitted Permitted Monday through Friday EXCEPT slat traps and hoop nets

permitted any day ~~and EXCEPT gill or trammel nets or the take or possession of grass carp are prohibited.~~ The take and possession of grass carp is prohibited. Permits available from area supervisor or Opelousas Wildlife Field Office. CLOSED until after 2 p.m. during waterfowl season.

Sport Fishing: ~~Same as outside EXCEPT only allowed after 2 p.m. during waterfowl season.~~ Same as outside EXCEPT only allowed after 2 p.m. during waterfowl season, EXCEPT during early TEAL SEASON, recreational fishing allowed after 10 a.m.

vi. Crawfish: March 15-July 31. Recreational only, 100 lbs. per person per day.

No hunting allowed in Headquarters area.

Only overnight campers allowed in the improved Boggy Bayou Camping area. Rules and Regulations posted at campsite. A fee is assessed for use of this campsite. Water skiing permitted only in Old River and Grand Lac.

tt. Tangipahoa Parish School Board. Self-Clearing Permits required for all activities. No horseback riding during gun season for deer or turkey. ATVs are not allowed except as otherwise specified.

Raccoon (Nighttime): Day after primitive firearms season ends to last day of Feb.

- i. Deer: Same as outside.
- ii. Turkey: Same as outside.
- iii. Small Game & Waterfowl: Same as outside and Open to squirrel hunting during the spring season, 1st Sat. of May for 9 days, with or without dogs. Beagles allowed for rabbits and dogs allowed for squirrel hunting day after primitive firearms season ends to the last day of Feb.

ii. Turkey:

(a). General Lottery: Opening day of statewide season for 2 days, 2nd Sat. of April for 2 days, 3rd Sat. of April for 2 days.

(b). Youth Lottery: Sat. before opening day of statewide season.

iii. Small Game & Waterfowl: Same as outside EXCEPT CLOSED during either-sex firearms hunts and Open to squirrel hunting during the spring season, 1st Sat. of May for 9 days, with or without dogs. Beagles allowed for rabbits and dogs allowed for squirrel hunting day after firearms bucks only season closes to last day of Feb.

(a). Youth Squirrel Hunt: 4th Sat. of Sept. for 2 days.

iv. Raccoon (Nighttime): Day after firearms bucks only season closes to last day of Feb.

vv. Bussey Brake. Area closed to all activities. No hunting allowed.

18. Other Areas

a. Camp Avondale Scout Reservation

i. Deer

(a). Firearms Either-sex: 2nd Sat. in November for 3 days. Restricted to scout program.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:115 and R.S. 56:116.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 25:1279 (July 1999), amended LR 26:1494 (July 2000), LR 27:1049 (July 2001), LR 28:1603 (July 2002), LR 29:1124 (July 2003), repromulgated LR 29:1522 (August 2003), amended LR 30:1495 (July 2004), LR 31:1611 (July 2005), LR 32:1251



2018 Changes to Federal Lands Schedule

Tommy Tuma | Louisiana Wildlife & Fisheries Commission Meeting |
February 1, 2018

US Army Corps of Engineers



Indian Bayou

Deer Youth Lottery: 3rd Sat. of Nov., Tues. after 3rd Sat. of Nov., 3rd Sat of Dec., Tues. after 3rd Sat. of Dec. Turkey:

Youth and Physically Challenged Lottery: Sat. before opening day of statewide season for 2 days EXCEPT when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days, 2nd Sat. of April for 2 days.



Old River Lock and Control Structure

Deer:

Archery, Primitive Firearms, and Shotgun only.

Archery: Oct. 1 – 15, bucks only, Oct 16-Jan. 31, either-sex, EXCEPT as otherwise specified.

Shotgun: Fri. after Thanksgiving for 3 days, either-sex, Last Sat. of Dec. for 9 days, bucks only.

Youth (17 yrs and under): Last Sat. of Oct. for 2 days, either sex.

Primitive Firearms: Mon. after close of Shotgun season for 7 days, either-sex Bucks only



NATIONAL PARK SERVICE



Barataria Preserve

~~(23,500~~ **22,500** Acres within Jefferson Parish owned by National Park Service)

Additional permit and regulations apply. Contact Jean Lafitte National Historical Park and Preserve at 504-689-3690 or www.nps.gov/jela for additional information.

Hunting permit applications accepted beginning July 1.

Hunting permits issued Mon. after 1st Sat. of Sept. — Oct. 1.

Hunting permits issued each Wed.-Sunday in Sept.

Hunting will be closed December 24-January 1.

All Barataria Preserve hunting ends Jan. 31.

All stands must be removed by 1st Sun. in Feb.

Deer:

Archery, bucks only: Oct. 1-15.

Archery, either-sex: Oct. 16-Dec. 23, Jan. 2- Jan. 31.

Shotgun, bucks only (unless either sex season is in progress): 2nd Sat. of Nov- Dec. 23, Jan. 2- .Next to last Sun. of Jan.

Shotgun, either-sex: Fri. after Thanksgiving for 3 days, 2nd Sat. of Dec. for 2 days, 2nd Sat. of Jan. for 2 days, 3rd Sat. of Jan. for 7 days.

Shotgun, youth, either-sex: 1st Sat. and Sun of Nov.

Feral Hogs:

Archery: Oct1-Dec. 23, Jan. 2-31.

Shotgun: 2nd Sat of Nov.-Dec 23, Jan 2-31.

Small Game: (squirrel, nutria, rabbit). 1st Sat. of Oct.- Dec. 23, Jan. 2- 31.

Migratory Game Birds & Waterfowl: Same as outside.



US FOREST SERVICE



Kisatchie National Forest

Firearms – Deer Hunting (excludes the Catahoula and Red Dirt National Wildlife Management Preserves):

- Catahoula (Grant & Rapides Parishes), Winn (Winn, Grant & Natchitoches parishes), Kisatchie Ranger Districts (Natchitoches Parish), Evangeline Unit of the Calcasieu Ranger District (Rapides Parish), and the Vernon Unit of the Calcasieu Ranger District (Vernon Parish, excluding Fort Polk-Vernon WMA).

Youth Only, either-sex, Same as outside, still hunt only; LDWF regulations for hunter orange apply.

Primitive Firearms, Either-sex: Next to last Sat. of Oct.- Sun. after the next to last Sat. of Oct., still hunt only. **Sat. after close of Dec. Firearms bucks only hunt for 2 days.**

Firearms, Either-sex: Last Sat. of Oct.-Sun. after the last Sat. of Oct., Fri. after Thanksgiving, still hunt only.

Firearms, Bucks only: Sat. after the last Sat. of Oct.- Thanksgiving, Sat. after Thanksgiving-Sun. after Thanksgiving, 2nd Sat. of Dec. for 16 days, still hunt only.



US FISH AND WILDLIFE SERVICE



DELTA NWR

Deer:

**Archery: Oct. 1-15, bucks only,
Oct. 16-31: either-sex.**

Day after waterfowl season closes end of state season, either-sex.

**Small Game: Day after waterfowl season closes-Last day of Feb.
Beagles allowed for rabbits.**

**Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon,
and EXCEPT CLOSED Mondays, Tuesdays, and Fridays.**

Raccoon, Opossum: Dec. 1-Jan. 31.



Public Hearings and Public Comments

- Public Comments will be accepted through 9:00 pm, March 1, 2018.
- All comments can be provided to:

Tommy Tuma
2000 Quail Drive
Baton Rouge, LA 70898
ttuma@wlf.la.gov
225-765-2349



FEDERAL LANDS HUNTING SCHEDULES - July 1, 2018 through June 30, 2019.

A. U.S. ARMY CORPS OF ENGINEERS AREAS

INDIAN BAYOU AREA

(28,500 Acres within St. Landry and St. Martin Parishes):

Additional Permit required and posted restrictions apply for all persons regardless of age. Permits must be signed prior to hunting any game and must be carried at all times while in the field. To obtain a permit, see bulletin boards on-site, visit the Atchafalaya Basin Floodway System Project Office, 112 Speck Lane, Port Barre, LA 70577, phone (337) 585-0853 or visit the project website <https://www.mvn.usace.army.mil/recreation/> (then click on Atchafalaya Basin). All hunting shall be still hunting only, **EXCEPT** as otherwise specified.

Deer:

Daily Limit on deer is one per day. Antler Deer Point Restriction: A legal buck shall be defined as a deer with at least 4 points on one side or a deer with unbranched antlers commonly referred to as spikes (no minimum length). To be counted as a point, a projection must be at least one inch long and its length must exceed the length of its base. The beam tip is counted as a point but not measured as a point.

Archery: Oct. 1-15 bucks only, Oct. 16-Feb. 15 either-sex.

Youth and Physically Challenged Deer Hunt: 4th Sat. of Oct. for 2 days, 1st Sat. of Nov. for 2 days, either-sex, no antler restrictions, Mandatory Deer Check. All other seasons **CLOSED**.

Firearms Either-sex: Fri. after Thanksgiving for 3 days, 1st Sat. of Dec. for 2 days. Mandatory Deer Check.

Primitive Firearms Either-sex: 2nd Fri. of Dec. for 3 days, 2nd Sat. of Jan. for 2 days.

Firearms Bucks Only: Last Sat. of Dec. for 9 days, Mandatory Deer Check.

Deer Youth Lottery: 3rd Sat. of Nov., Tues. after 3rd Sat. of Nov., 3rd Sat. of Dec., Tues. after 3rd Sat. of Dec. Turkey:

Youth and Physically Challenged Lottery: Sat. before opening day of statewide season for 2 days **EXCEPT** when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days, **2nd Sat. of April for 2 days.**

General Lottery: Opening day of statewide season for 2 days **EXCEPT** when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days.

Small Game, Migratory Game Birds & Waterfowl: Same as outside **EXCEPT CLOSED** during Youth and Physically Challenged Deer Hunt, and during Firearms Either-sex deer season (**EXCEPT** waterfowl season will remain open during all deer gun hunts). Hunting waterfowl after 2:00 p.m. prohibited. Squirrel and rabbit hunting with dogs allowed Mon. after 2nd Sat. of Jan.- Last day of Feb. Youth squirrel hunt 4th Sat. of Sept. for 2 days. Raccoon (Nighttime): 2nd Sat. of Sept. for 16 days, Mon. after 2nd Sat. of Jan.- Last day of Feb. Special use permit required.

Hogs, Coyote, Beaver, and Nutria: May be taken incidental to any hunt with weapons legal for that hunt. Consult U.S. Army Corps of Engineers' "Hunting Guide to Indian Bayou" brochure for additional posted restrictions.

OLD RIVER CONTROL & LOCK AREA

(2,699 acres within Pointe Coupee, West Feliciana, and Concordia Parishes, owned by U.S. Army Corps of Engineers):

Additional permit not required; however, posted restrictions apply. For more information, visit the project website at www.mvn.usace.army.mil/Missions/Recreation/OldRiverControl.aspx, or contact the U.S. Army Corps of Engineers, Old River Control Natural Resources Specialist at (225) 492-2169 for more information.

All hunting shall be still-hunting only, **EXCEPT** as otherwise specified.

Deer:

Archery, Primitive Firearms, and Shotgun only.

Archery: Oct. 1 – 15, bucks only, Oct 16-Jan. 31, either-sex, **EXCEPT** as otherwise specified.

Shotgun: Fri. after Thanksgiving for 3 days, either-sex, Last Sat. of Dec. for 9 days, bucks only.

Youth (17 yrs and under): Last Sat. of Oct. for 2 days, either sex.

Primitive Firearms: Mon. after close of Shotgun season for 7 days, **either-sex Bucks only**

Turkey: Opening day of statewide season for 16 days, EXCEPT season will open for 17 days when statewide season opens on Good Friday.

Small Game & Waterfowl: Same as outside, hunting waterfowl after 2 p.m. is prohibited. Squirrel and rabbit hunting with dogs allowed Mon. after Thanksgiving- Fri. before the last Sat. of Dec. Mon. after close of Primitive Firearms season- Last day of Feb.

Woodcock: Same as outside, EXCEPT hunting with dogs allowed Dec. 18-Fri. before the last Sat. of Dec., and Mon. after close of Primitive Firearms season- Jan 31.

Night time Raccoon hunting, with dogs Mon. after Thanksgiving- Fri. before the last Sat. of Dec. and Mon. after close of Primitive Firearms season- Last day of Feb.

BONNET CARRE SPILLWAY

(7,623 acres within St. Charles Parish, owned by U.S. Army Corps of Engineers):

Additional permit required and posted restrictions apply for all persons regardless of age. Permits must be signed prior to hunting any game and must be carried at all times while in the field. For permits or more information, see bulletin boards on-site, visit the project website at www.mvn.usace.army.mil/recreation/ (then click on Bonnet Carré Spillway), or contact the U.S. Army Corps of Engineers, Bonnet Carré Spillway Project Office at (985) 764-7484 for more information.

All hunting shall be still-hunting only, EXCEPT as otherwise specified.

Deer: Archery and Shotgun (buckshot) only.

Archery: Oct. 1 - Oct 15 bucks only; Oct 16 - Feb. 15, either sex

Shotgun: Fri. after Thanksgiving for 3 days, either-sex; 3rd Sat. of Dec. for 16 days, bucks only

Youth: 4th Sat. of Oct. for 2 days, either sex. Additional permit required from Spillway office.

Small Game & Waterfowl: Same as outside, EXCEPT hunting waterfowl after 12 noon is prohibited, and EXCEPT hunting squirrel and rabbit with dogs is prohibited only on that portion north of US Hwy. 61 during shotgun season for deer.

B. NATIONAL PARK SERVICE AREAS

BARATARIA PRESERVE

(23,500 22,500 Acres within Jefferson Parish owned by National Park Service)

Additional permit and regulations apply. Contact Jean Lafitte National Historical Park and Preserve at 504-689-3690 or www.nps.gov/jela for additional information.

Hunting permit applications accepted beginning July 1.

Hunting permits issued Mon. after 1st Sat. of Sept. - Oct. 1.

Hunting permits issued each Wed.-Sunday in Sept.

Hunting will be closed December 24-January 1.

All Barataria Preserve hunting ends Jan. 31.

All stands must be removed by 1st Sun. in Feb.

Deer:

Archery, bucks only: Oct. 1-15.

Archery, either-sex: Oct. 16-Dec. 23, Jan. 2- Jan. 31.

Shotgun, bucks only (unless either sex season is in progress): 2nd Sat. of Nov- Dec. 23, Jan. 2- .Next to last Sun. of Jan.

Shotgun, either-sex: Fri. after Thanksgiving for 3 days, 2nd Sat. of Dec. for 2 days, 2nd Sat. of Jan. for 2 days, 3rd Sat. of Jan. for 7 days.

Shotgun, youth, either-sex: 1st Sat. and Sun of Nov.

Feral Hogs:

Archery: Oct1-Dec. 23, Jan. 2-31.

Shotgun: 2nd Sat of Nov.-Dec 23, Jan 2-31.

Small Game: (squirrel, nutria, rabbit). 1st Sat. of Oct.- Dec. 23, Jan. 2- 31.

Migratory Game Birds & Waterfowl: Same as outside.

C. U.S. FOREST SERVICE AREAS

KISATCHIE NATIONAL FOREST (KNF)

Vehicles:

- Motorized travel off designated roads and trails and outside designated areas is prohibited on the entire KNF. Motor Vehicle Use Maps (MVUM) showing designated roads and trails and associated vehicles and travel seasons are available in all Forest Service offices and on the Kisatchie website (www.fs.usda.gov/kisatchie).
- ATV/UTV (50" maximum width): operation is prohibited on public roads and road rights-of-ways. Use is allowed on Forest roads designated as open seasonally to ATV/UTV use. Use is prohibited in some campsites and recreation areas; see bulletin boards for additional information. (Also see MVUM)
- Nighttime ATV/UTV travel is prohibited. ATV/UTV travel is allowed between one hour before sunrise and one hour after sunset.
- Game retrieval with an ATV/UTV is only allowed within designated 300-foot corridors (see MVUM).
- Camping corridors for highway legal vehicles to drive within 100 feet of the road and camp are designated on the Caney District and in the National Red Dirt Wildlife Management Preserve.

Firearms:

- Hunting or discharging a firearm is prohibited as follows;
 - In or within 150 yards of a residence, building, campsite, developed recreation site or occupied area
 - Across/on/from a NFSR (National Forest System Road) legally open to motorized use
 - Across a body of water where any person/property is exposed to injury/damage as a result of such a discharge
 - Hunting within 50 feet of any NFSR
- It is prohibited to possess a firearm having live ammunition in the chamber, magazine, cylinder or clip (when attached to a firearm), or crossbow cocked and in the ready position in or on any type vehicle while on KNF. • All deer must be tagged as required by LDWF regulations.

- Active and retired law enforcement officers in compliance with POST requirements, Federal Law Enforcement Officers, holders of Louisiana concealed handgun permits or permit holders from a reciprocal state, who are in compliance with all other state and federal firearms regulations, may possess firearms while on KNF lands, provided these firearms are not used for any hunting purposes.

- The following cannot be carried while hunting on KNF lands except during modern and primitive deer seasons.

- Centerfire rifles
- Break-action centerfire and bolt-action centerfire hand guns
- Scoped centerfire handguns
- Shotgun slugs or shot larger than BB lead or F steel

Hunter Orange:

- LDWF WMA regulations for hunter orange and blaze pink apply.

General: Hunting or discharging a firearm in or within 150 yards of a residence, building, campsite, developed recreation site or occupied area, across/on a NFSR (National Forest System Road) legally open to motorized use, across a body of water where any person/property is exposed to injury/damage as a result of such discharge, is prohibited.

Hunting General:

- Deer Bag Limit = 1 per day up to the statewide seasonal limit
- All deer hunting is still-hunting only.
- All deer must be tagged as required by LDWF regulations.
- Hunting stand, blind, tripod, baiting, spot-lighting, etc. regulations applicable to LDWF WMAs are in effect on KNF (unless otherwise specified, refer to "Methods of Taking Game" section of the LDWF WMA Regulations): excluding the "Bag Limit" section and "Horses and Mules" section.
- Hunting from a permanent stand prohibited. Placing or leaving a temporary stand limited to 24 hours.
- The training of deer dogs is prohibited year-round.
- See separate schedule for Catahoula and Red Dirt National Wildlife Management Preserves.
- LDWF Youth Deer Hunt regulations apply for all KNF lands except that archery and open season small game hunting is allowed (excluding those portions of the Vernon Unit within Fort Polk-Vernon WMA).

Archery – Deer Hunting:

- General: either-sex deer may be taken at any time by archers during the archery season EXCEPT when bucks-only firearms seasons are in progress on KNF (archers must hunt only bucks during bucks-only firearm seasons)
- Archers must adhere to the full hunter orange requirements during any firearm season for deer.
- Vernon Unit of the Calcasieu Ranger District (Vernon Parish, excluding Fort Polk-Vernon WMA): Same as outside.
- Catahoula (Grant & Rapides parishes), Winn (Winn, Grant & Natchitoches parishes), Kisatchie Ranger Districts (Natchitoches Parish), Evangeline Unit of the Calcasieu Ranger District (Rapides Parish), and Caney Ranger District (Webster and Claiborne parishes): Same as outside (including Catahoula and Red Dirt National Wildlife Management Preserves).

Firearms – Deer Hunting (excludes the Catahoula and Red Dirt National Wildlife Management Preserves):

- Catahoula (Grant & Rapides Parishes), Winn (Winn, Grant & Natchitoches parishes), Kisatchie Ranger Districts (Natchitoches Parish), Evangeline Unit of the Calcasieu Ranger District (Rapides Parish), and the Vernon Unit or the Calcasieu Ranger District (Vernon Parish, excluding Fort Polk-Vernon WMA).

Youth Only, either-sex, Same as outside, still hunt only; LDWF regulations for hunter orange apply.

Primitive Firearms, Either-sex: Next to last Sat. of Oct.- Sun. after the next to last Sat. of Oct., still hunt only. Sat. after close of Dec. Firearms bucks only hunt for 2 days.

Firearms, Either-sex: Last Sat. of Oct.-Sun. after the last Sat. of Oct., Fri. after Thanksgiving, still hunt only.

Firearms, Bucks only: Sat. after the last Sat. of Oct.- Thanksgiving, Sat. after Thanksgiving-Sun. after Thanksgiving, 2nd Sat. of Dec. for 16 days, still hunt only.

- Caney Ranger District (Webster and Claiborne parishes): Same as outside including Youth Hunt and Primitive Firearms (Area 2) except still hunt only. Either-sex entire season.

Turkey: Opening day of statewide season for 23 days

EXCEPT season will open for 24 days when statewide season opens Good Friday (on all ranger districts EXCEPT the Caney Ranger District), Opening day of statewide season for 16 days EXCEPT season will open for 17 days when statewide season opens Good Friday (Caney Ranger District).

Youth: Sat. before opening day of statewide season for 2 days EXCEPT when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days (on all Ranger Districts except Vernon Unit lands within Ft. Polk-Vernon WMA).

Other seasons on Entire KNF (See Catahoula/Red Dirt National Wildlife Management Preserve section for additional info):

- Rabbit, Squirrel, Quail & Migratory Game Birds: Same dates and bag limits as outside except closed to squirrel hunting during the spring season. Youth squirrel: 4th Sat. of Sept for 2 days.
- Waterfowl: Same as outside EXCEPT waterfowl hunting ceases at 2 p.m. If hunting on Corney Lake (Caney Ranger District) a permit (free of charge) is required for the use of a duck blind on the lake.
- Feral Hogs, Coyotes, Armadillos & Beavers: May be taken during daylight hours only, on any KNF hunt by properly licensed hunters with weapons legal for that hunt
- Raccoons, Opossums, Fox (chase only) (nighttime, chase only): May be hunted during daylight or nighttime from Oct. 1 - Feb. 28 unless otherwise stated. A licensed hunter may take raccoon or opossum, two per person per day, except during the trapping season when there shall be no limit. (Please see Louisiana Trapping Regulations pamphlet for additional information. Also please see "Hunting-dog usage during deer firearm seasons" section below for exceptions.)
- Bobcat and Nutria: LDWF Regulations apply.

- **Crows, Blackbirds, Grackles & Cowbirds:** May be taken Sept. 1-Jan. 1 only.
- **Fishing:** LDWF state creel limits apply (See Louisiana Fishing Regulations pamphlet for additional information).
- **Trapping:** See LDWF Trapping Regulations pamphlet for additional information.

Hunting Dog Usage:

Hunting-dog usage during deer firearm seasons (only for KNF areas outside the Catahoula and Red Dirt National Wildlife Management Preserves): Hunting dogs that are legal for hunting species other than deer, and that stay within voice-command distance of handler are allowed during deer gun hunts. Hunting dogs that range beyond voice-command distance of handler are prohibited during deer gun hunts. The training of deer or hog dogs is prohibited year-round. Hunting with; recognized bird-hunting dogs during quail and woodcock seasons, recognized raccoon-hunting dogs during raccoon hunting season and recognized pointer/retriever dogs during migratory bird season is permissible. Only beagles which do not exceed 15 inches at the front shoulder may be used for rabbit hunting. All dogs must be collared with owner's name and phone number attached. Dogs running at large are prohibited. The owner/handler shall be liable.

Hog hunting with dogs is not allowed.

Hunting-dog training: from March 1- Sept. 30. (EXCEPT all dogs prohibited during turkey hunting season), Allowed only in the following circumstances: dogs are within voice-command distance of handler; dogs are participating in night-time raccoon chases mentioned above; dogs are participating in licensed events conducted by nationally-recognized kennel clubs (KNF permit required – contact Forest Supervisor's office); dogs are under close control of hikers; and any dog on a leash. No firearms allowed while training dogs. Hunting-dog training prohibited in Catahoula and Red Dirt National Wildlife Management Preserves.

Bird Dog Training Area: Only that portion of the Vernon Unit known as the "dove field". Bird dogs may be trained year round EXCEPT CLOSED during turkey season. Permit required from LDWF to use pen-raised quail."

Hunting-dog Nighttime Chase Only: (All breeds allowed, no deer dogs or hog dogs). May 1 - Sept. 30, Tuesdays and Fridays only. No firearms allowed. Nighttime ATV/UTV travel is prohibited.

Hunting-dog nighttime chase is prohibited in the Catahoula and Red Dirt National Wildlife Management Preserves during this period.

Catahoula and Red Dirt National Wildlife Management Preserves (NWMP)

Owner: U. S. Forest Service: (Catahoula NWMP - 36,000 Acres in Grant and Winn Parishes; Red Dirt NWMP - 38,000 Acres in Natchitoches Parish).

Season Permit required for hunting, fishing and or trapping on the preserve: for a permit or to get additional information contact; the Forest Supervisor's office, Winn, Catahoula or Kisatchie Ranger District offices or www.fs.fed.us/r8/kisatchie/hunting/index.html. In addition to the Season Permit a **Self-clearing Daily Permit** is required

for all hunters during all deer gun hunts and turkey hunts. The Self-clearing Daily Permits will be available at the main check stations, hunter-camps within the NWMPs, Kisatchie, Winn and Catahoula district offices, and at the Forest Supervisor's Office. Permits are free of charge. The self-clearing permit consists of two portions; check-in and check-out. The check in portion **must** be completed and put in the permit box before each hunt on the day of the hunt. The check-out portion **must** be carried by each person while on the NWMP and **must** be completed and put in the permit box immediately at the end of the day's hunt.

Note: When Mandatory Deer Checks are specified (see below), all hunters **must** check deer at the NWMPs main check stations.

Hunting with Dogs: Hunting with; recognized bird-hunting dogs during quail and woodcock seasons, recognized raccoon-hunting dogs during raccoon hunting season, and recognized pointer/retriever dogs during migratory bird season is permissible. Only beagles which do not exceed 15 inches at the front shoulder may be used for rabbit hunting. All dogs must be collared with owner's name and phone number attached. Dogs running at large are prohibited. The owner/handler shall be liable. No training of dogs in the NWMPs outside of pertinent seasons.

Select Prohibitions: Additional information and prohibitions are provided on Season Permit for the NWMPs.

Deer:

Archery Season: Same as Area 2. Archers are required to check harvested deer at the main check station during the mandatory deer check days, see dates below.

Youth Only Hunt, Either-sex: Same as outside, still hunt only. Self-clearing daily permit required.

Physically-challenged Hunt, Either-sex: Second Saturday of Oct.- Sun. after the second Saturday of Oct., still hunt only, self-clearing daily permit required; hunters must also have in possession a LDWF Physically Challenged Hunters Permit.

Primitive Firearms, Either-sex: Next to last Sat. of Oct.- Sun. after the next to last Sat. of Oct., still-hunt only, self-clearing daily permit required. Mandatory deer check at main check stations.

Firearms, Either-sex: Last Sat. of Oct.-Sun. after the last Sat. of Oct., and Fri. after Thanksgiving, still-hunt only, self-clearing daily permit required. Mandatory deer check at main check stations.

Firearms, Bucks only: Sat. after Thanksgiving-Sun. after Thanksgiving, still-hunt only, self-clearing daily permit required.

Turkey: Opening day of statewide season for 23 days EXCEPT season will open for 24 days when statewide season opens Good Friday.

Youth: Sat. before opening day of statewide season for 2 days EXCEPT when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days.

Squirrel, Rabbit, Quail, Dove, Woodcock, and Waterfowl (without dogs): All seasons same as outside (unless otherwise stated) except closed during deer firearm hunts. Consult LDWF hunting pamphlet for additional information. No spring squirrel season.

Youth Squirrel: 4th Sat. of Sept. for 2 days.

Squirrel/Rabbit (with dogs): 1st Sat. of Jan. - Last day of Feb.

Quail (with dogs): Same as outside.

Raccoon/Opossum (non-dog season/daylight hours) May be taken by properly licensed hunter as incidental take with gear legal for the season in progress.

Raccoon (nighttime, with dogs): 1st Sat. of Jan. - Last day of Feb.

Fishing: Closed to fishing during deer gun hunts.

D. U.S. FISH AND WILDLIFE SERVICE AREAS

BAYOU COCODRIE NATIONAL WILDLIFE REFUGE

(14,668 acres within Concordia Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: 1st Sat. in Nov. - Jan. 31, either-sex, limit one deer per day.

Youth Lottery: 2nd Sat. of Dec., 3rd Sat. of Dec., 2nd Sat. of Jan., either-sex, state limits apply.

Physically Challenged Lottery: 3rd Sat. of Jan. for 2 days, either sex, state limits apply.

Lottery Firearms: 1st Fri. of Dec. for 2 days, either sex, limit one deer per day.

Youth Firearms: Last Sat. of Oct. for 2 days, either-sex, state limits apply.

Primitive Firearms: 1st Sat. of Jan. for 7 days, either-sex, limit one deer per day.

Turkey:

Youth: Sat. before opening day of statewide season for 2 days, EXCEPT when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days.

Small Game: Same as outside EXCEPT CLOSED during youth firearms, primitive firearms, and lottery hunts for deer. Beagles allowed for rabbits and dogs allowed for squirrel hunting Mon. after 3rd Sat. of Jan.- Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED on Mondays, Wednesdays, Fridays, and during youth firearms, primitive firearms, and lottery hunts for deer.

BAYOU SAUVAGE NATIONAL WILDLIFE REFUGE

(25,000 acres within Orleans Parish, owned by U.S. Fish and Wildlife Service):

Waterfowl (Youth Hunts): same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED on Mondays, Tuesdays, and Fridays.

BAYOU TECHE NATIONAL WILDLIFE REFUGE

(9,028 acres within St. Mary Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31 EXCEPT CLOSED during youth and firearms deer seasons, either-sex, limit one deer per day.

Youth Firearms: Last Sat. of Oct. for 2 days, either-sex, limit one deer per day.

Firearms: Fri after Thanksgiving for 3 days, either-sex, limit one deer per day.

Small Game: 1st Sat. of Oct.-Jan. 31, EXCEPT CLOSED during youth and firearms deer seasons.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED during firearms deer season.

BIG BRANCH MARSH NATIONAL WILDLIFE REFUGE

(19,000 acres within St. Tammany Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31 either-sex.

Small Game: Same as outside, EXCEPT CLOSED during spring squirrel season. Beagles allowed for rabbits and dogs allowed for squirrel hunting Feb. 1-Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED on Mondays, Tuesdays, and Fridays.

BLACK BAYOU NATIONAL WILDLIFE REFUGE

(4,500 6,300 acres within Ouachita Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31, either-sex, limit one deer per day.

Small Game: Same as outside EXCEPT CLOSED during spring squirrel season. Beagles allowed for rabbit and dogs allowed for squirrel hunting Jan. 1- Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon.

Raccoon, Opossum: Dec. 1-Jan. 31.

BOGUE CHITTO NATIONAL WILDLIFE REFUGE

(36,000 acres within St. Tammany Parish and Pearl River County, MS, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31, either-sex.

Youth Firearms: 2nd Fri. of Nov. for 3 days, either-sex.

Firearms: 3rd Sat. of Nov. for 9 days, Sat. before Christmas for 9 days, either-sex.

Primitive Firearms: Jan. 22-31 (either-sex)

Turkey: Opening day of statewide season for 23 days
EXCEPT season will open for 24 days when statewide season opens Good Friday.

Youth: Sat. before opening day of statewide season for 2 days **EXCEPT** when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days.

Small Game: Same as outside **EXCEPT CLOSED** during spring squirrel season and during deer firearms and primitive firearms hunts. Beagles allowed for rabbit and dogs allowed for squirrel hunting Mon. after 3rd Sat. of Oct. for 14 days, and Feb. 1-Last day of Feb.

Waterfowl: same as outside **EXCEPT CLOSED** after 12:00 noon.

Raccoon, Opossum (nighttime only): Jan. 1-Last day of Feb.

CAMERON PRAIRIE NATIONAL WILDLIFE REFUGE

(9,621 acres within Cameron Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Fri. before state waterfowl season opens, either-sex.

Waterfowl Youth Lottery: Open all Saturdays, and also weekdays during school holidays during state Area season. **CLOSED** after 2:00 pm.

Waterfowl Senior Lottery (seniors 55 and older): Designated Wednesdays during state Area season. **CLOSED** after 2:00 pm.

Snipe: Day after waterfowl season closes-End of state season.

Dove: Open during 1st split of state season one half hour before sunrise to sunset.

CATAHOULA NATIONAL WILDLIFE REFUGE

(25,162 acres within Catahoula and LaSalle Parishes, owned by U.S. Fish and Wildlife Service):

Headquarters Unit Seasons:

Deer:

Archery: Oct. 1-Jan. 31, either-sex, limit one deer per day, **EXCEPT CLOSED** in the French Fork Unit during the firearms season.

Firearms: Fri. after Thanksgiving for 3 days, either-sex, limit one deer per day, area south of French Fork only.

Small Game: 1st Sat. in Oct.-Oct. 31 and 1st Sat. of Feb.-Last day of Feb.

Bushley Bayou Unit Seasons:

Deer:

Archery: Oct. 1-Jan. 31, either-sex, limit one deer per day, **EXCEPT CLOSED** during the firearms and primitive firearms seasons for deer.

Firearms: Fri. after Thanksgiving for 3 days, 2nd Sat. of Dec. for 2 days, either-sex, limit one deer per day.

Primitive Firearms: Mon. after 2nd Sat. in Nov. for 5 days, 3rd Sat. in Dec. for 2 days, either-sex, limit one deer per day.

Small Game: Same as outside **EXCEPT CLOSED** during the firearms and primitive firearms seasons for deer. Beagles allowed for rabbits and dogs allowed for squirrel hunting Dec. 19-Last day of Feb.

Waterfowl: same as outside **EXCEPT CLOSED** after 12:00 noon and **EXCEPT CLOSED** on Mondays, Wednesdays, and Fridays, and **EXCEPT CLOSED** during the firearms and primitive firearms seasons for deer.

CAT ISLAND NATIONAL WILDLIFE REFUGE

(10,473 acres within West Feliciana Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-15, bucks only, limit one deer per day. Oct. 16-Feb. 15, either-sex, limit one deer per day, **EXCEPT CLOSED** during lottery deer seasons.

Youth Firearms: 1st Sat. of Nov. for 2 days, either-sex, limit one deer per day.

Lottery Primitive Firearms: 2nd Sat. of Nov. for 2 days, either sex, limit one deer per day.

Lottery Firearms: 2nd Sat. of Dec. for 2 days, either-sex, state limits apply.

Small Game: Same as outside **EXCEPT CLOSED** during lottery deer seasons. Beagles allowed for rabbits and dogs allowed for squirrel hunting 1st Mon. of Jan.- Last day of Feb.

Waterfowl: same as outside **EXCEPT CLOSED** after 12:00 noon and **EXCEPT CLOSED** on Mondays, Wednesdays, and Fridays, and **EXCEPT CLOSED** during lottery deer seasons.

D'ARBONNE NATIONAL WILDLIFE REFUGE

(17,419 acres within Ouachita and Union Parishes, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31, either sex,

Physically Challenged: 2nd Sat. of Nov. for 2 days, either-sex.

Firearms: 1st Sat. of Nov. for 2 days, Friday after Thanksgiving for 3 days, 1st Sat. of Dec. for 2 days, either-sex.

Small Game: Same as outside **EXCEPT CLOSED** during spring squirrel season. Beagles allowed for rabbits and dogs allowed for squirrel hunting Mon. after 1st Sat. in Dec.- Last day of Feb.

Waterfowl: same as outside **EXCEPT CLOSED** after 12:00 noon.

Raccoon, Opossum: Dec. 1-Jan. 31.

DELTA NATIONAL WILDLIFE REFUGE

(48,800 acres within Plaquemines Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-15, bucks only,

Oct. 16-31: either-sex.

Day after waterfowl season closes end of state season, either-sex.

Small Game: Day after waterfowl season closes-Last day of Feb. Beagles allowed for rabbits.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED Mondays, Tuesdays, and Fridays.

Raccoon, Opossum: Dec. 1-Jan. 31.

GRAND COTE NATIONAL WILDLIFE REFUGE

(6,000 acres within Avoyelles Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-15, bucks only, limit one deer per day.

Oct. 16-Feb. 15, either-sex, limit one deer per day,

Small Game: Same as outside. Beagles allowed for rabbits Feb. 1-Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon and EXCEPT CLOSED on Sundays, Mondays, Tuesdays, Thursdays, and Fridays.

Waterfowl Lottery: Wednesdays and Saturdays during the second split of state waterfowl season.

Waterfowl Youth: Saturday of state waterfowl hunt, EXCEPT CLOSED after 12:00 noon.

Raccoon, Opossum: Dec. 1-Jan. 31.

LACASSINE NATIONAL WILDLIFE REFUGE

(34,878 acres within Cameron and Evangeline Parishes, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Fri. before state waterfowl season opens, either-sex.

Waterfowl: same as outside EXCEPT CLOSED after 2:00 pm, and EXCEPT CLOSED on Mondays, Tuesdays, and Fridays.

Waterfowl Youth Lottery: Open designated Saturdays, and also weekdays during school holidays during 2nd split, EXCEPT CLOSED after 2:00 pm.

Waterfowl Senior Lottery (seniors 55 and older):
Designated Wednesdays during state Area season.
CLOSED after 2:00pm.

LAKE OPHELIA NATIONAL WILDLIFE REFUGE

(17,500 acres within Avoyelles Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Nov. 1- Feb. 15, either-sex, limit one deer per day, EXCEPT CLOSED during lottery deer seasons.

Lottery Youth Firearms: Dates to be announced, either-sex.

Lottery Primitive Firearms: Dates to be announced, either-sex, two deer per hunt (one antlered and one antlerless).

Turkey: Opening day of statewide season for 16 days (CLOSED after 12:00 noon).

Youth Lottery: Sat. before opening day of statewide season.

Small Game: Same as outside EXCEPT CLOSED during lottery deer seasons and youth waterfowl season, . Beagles allowed for rabbits and dogs allowed for squirrel hunting Feb. 1-Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon and EXCEPT CLOSED on Sundays, Mondays, Wednesdays, and Fridays, and EXCEPT CLOSED during lottery deer seasons.

Waterfowl Youth: Saturday of state waterfowl hunt, EXCEPT CLOSED after 12:00 noon.

MANDALAY NATIONAL WILDLIFE REFUGE

(4,416 acres within Terrebonne Parish, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-15, bucks only.

Oct. 16-Feb. 15, either-sex, limit one deer per day.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED Sundays, Mondays, Tuesdays, Thursdays, and Fridays.

Waterfowl Youth Lottery: same as outside EXCEPT CLOSED after 12:00 noon, and EXCEPT CLOSED Sundays, Mondays, Tuesdays, Thursdays, and Fridays.

RED RIVER NATIONAL WILDLIFE REFUGE

(15,088 acres within Bossier, Caddo, Desoto, Red River, and Natchitoches Parishes, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31, either-sex, limit one deer per day.

Small Game: Same as outside EXCEPT CLOSED during spring squirrel season. Beagles allowed for rabbits and dogs allowed for squirrel hunting Jan. 1-Last day of Feb.

Waterfowl: same as outside EXCEPT CLOSED after 12:00 noon.

Waterfowl Youth Lottery: Dates to be determined.

Dove: 1st 2 days of state season.

Raccoon, Opossum: Dec. 1-Jan. 31.

SABINE NATIONAL WILDLIFE REFUGE

(125,000 acres within Cameron Parish, owned by U.S. Fish and Wildlife Service):

Waterfowl: same as outside EXCEPT CLOSED after 2:00 pm, and EXCEPT CLOSED on Mondays, Tuesdays, and Fridays.

TENSAS RIVER NATIONAL WILDLIFE REFUGE

(80,000 acres within Tensas and Madison Parishes, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: 1st Sat. of Nov. – Jan. 31, either-sex, limit one deer per day, **EXCEPT CLOSED** during youth firearms deer season and quota firearms season.

Youth Lottery: Dates to be announced, either-sex.

Youth Firearms: Last Sat. of Oct. for 2 days, either-sex, limit one deer per day.

Lottery Full-Time Wheelchair User: Dates to be announced, either sex.

Quota Firearms: Fri. after Thanksgiving for 2 days, 2nd Sat. of Dec. for 2 days, either-sex, limit one deer per day.

Firearms, antlerless only: 3rd Sat. of Nov., antlerless only.

Primitive Firearms: 1st Sat. of Dec. for 2 days, either-sex, limit one deer per day.

Turkey: Opening day of statewide season for 16 days
EXCEPT season will open for 17 days when statewide season opens Good Friday.

Youth: Sat. before opening day of statewide season for 2 days **EXCEPT** when that Sat. falls on Easter weekend, then season will open on Good Friday for 3 days.

Small Game: Oct. 1- Last day of Feb., **EXCEPT CLOSED** during youth firearms deer season, firearms, antlerless only season, Quota firearms season, and primitive firearms deer seasons. Beagles allowed for rabbits and dogs allowed for squirrel hunting Jan. 1 –Last day of Feb., **EXCEPT** feral hogs may not be taken with the aid of dogs. .

Waterfowl: same as outside **EXCEPT CLOSED** after 2:00 pm and **EXCEPT CLOSED** on Mondays, Wednesdays, and Fridays.

Raccoon (nighttime): 2nd Sat. in Dec. through 3rd Sun. in Jan.

UPPER OUACHITA NATIONAL WILDLIFE REFUGE

(52,848 54,196 acres within Ouachita and Union Parishes, owned by U.S. Fish and Wildlife Service):

Deer:

Archery: Oct. 1-Jan. 31, either sex, limit one deer per day.

Firearms: 1st Sat. of Nov. for 2 days, Friday after Thanksgiving for 3 days, 1st Sat. of Dec. for 2 days, either-sex, limit one deer per day.

Turkey:

Youth Lottery: Sat. before opening day of statewide season.

Small Game: Same as outside **EXCEPT CLOSED** during spring squirrel season. Beagles allowed for rabbits and dogs allowed for squirrel hunting Mon. after 1st Sat. of Dec.- Last day of Feb.

Waterfowl: same as outside **EXCEPT CLOSED** after 12:00 noon.

Dove: 1st split of state season.

Raccoon, Opossum: Dec. 1-Jan. 31.

Bear Program Update

February, 2018



Maria Davidson
Large Carnivore Program Manager

Delisted in April of 2016



Guidance Documents

U.S. FISH AND WILDLIFE SERVICE

Draft Post-Delisting Monitoring Plan for the Louisiana
Black Bear (*Ursus americanus luteohus*)



Prepared by:

U.S. Fish and Wildlife Service
Louisiana Ecological Services Field Office
Lafayette, Louisiana

"Monitor the species to ensure the
status does not decline"

Response Triggers

Category 1: Louisiana black bear population remains
secure without ESA protections

Category 2: Louisiana black bear population may be
less stable than at time of listing, but does NOT
warrant ESA protections

Category 3: Louisiana black bear population is
experiencing threats causing a decline that may
warrant ESA protections

Three Categories based on:

Population vital rates

Habitat

New or increasing threats

Category 1 Goal

Maintain >95% chance of persistence
Over 100 years

Change in population size
Survival
Recruitment

>.90 Adult Female Survival



Post Delisting Monitoring

LDWF responsible for population monitoring.

Monitoring Action		Year 1 (2016)	Year 2 (2017)	Year 3 (2018)	Year 4 (2019)	Year 5 (2020)	Year 6 (2021)	Year 7 (2022)
Population Monitoring	Hair Snare (TRB & UARB)	X	X	X	X	X	X	X
	Hair Snare (TRC & Corridor)					X		
	Live Trapping (All)	X	X	X	X	X	X	X
	Den Checks (All)	X	X	X	X	X	X	X

Guidance Documents

LOUISIANA BLACK BEAR MANAGEMENT PLAN

Ursus americanus luteolus



January 2015

Management objective:

Maintain a sustainable
black bear population in
suitable habitat for the
benefit of the species and
Louisianans

Management objective:

3 overarching management activities

- Education
- Human/Bear Conflict
- Harvest



Education

BearWise Program

Black Bear Teacher Resource website

Traveling library display

Teacher Workshops



Human/Bear Conflict

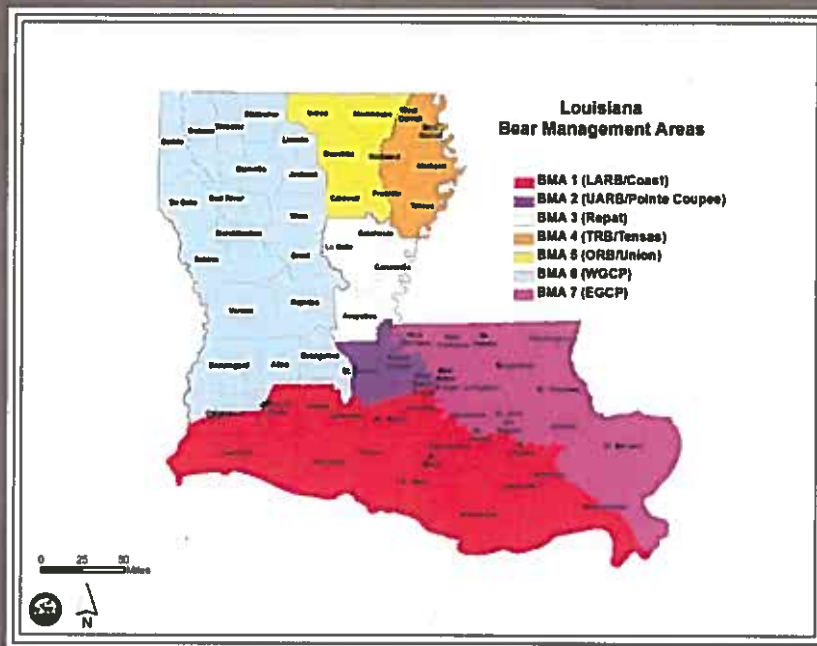
BearWise Program
Black Bear Teacher Resource
Traveling library display
Conflict Response
Local law enforcement
training



Train LDWF Regional Biologists



Bear Management Areas



First PDM Report

Louisiana Black Bear
Post-Delisting Monitoring



1st Annual Report
2016

Tensas River Basin

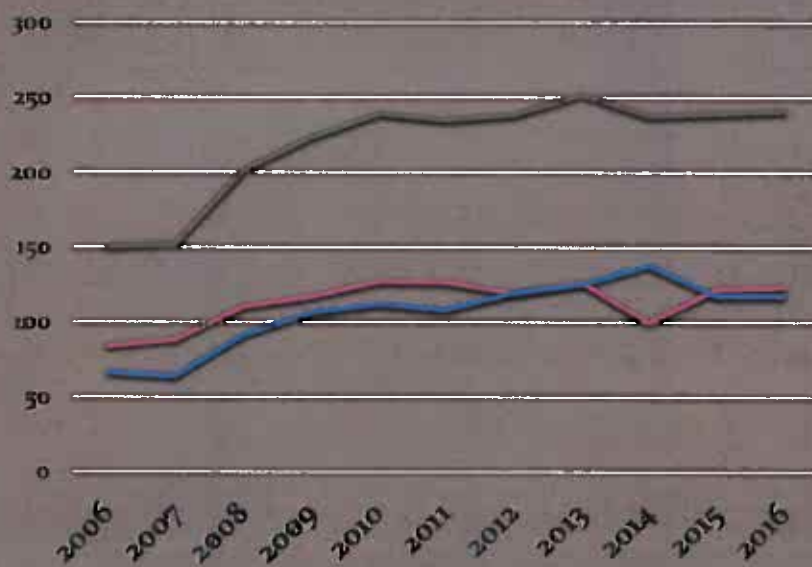


241 Population Estimate

123 Females

.936 apparent female survival

TRB Abundance



Three Rivers Complex



97 Population
Estimate

46 Females

(work in progress)

Upper Atchafalaya

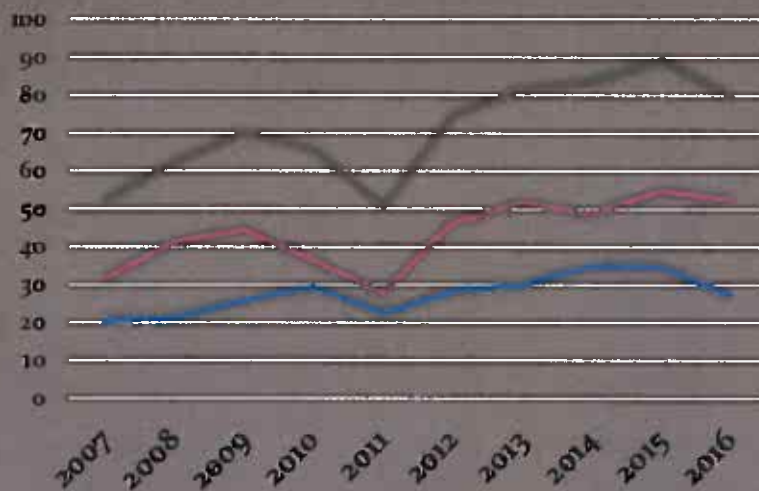


80 Population
Estimate

52 Females

.969 Apparent
Female survival

UARB Abundance



Lower Atchafalaya



175 Population
Estimate

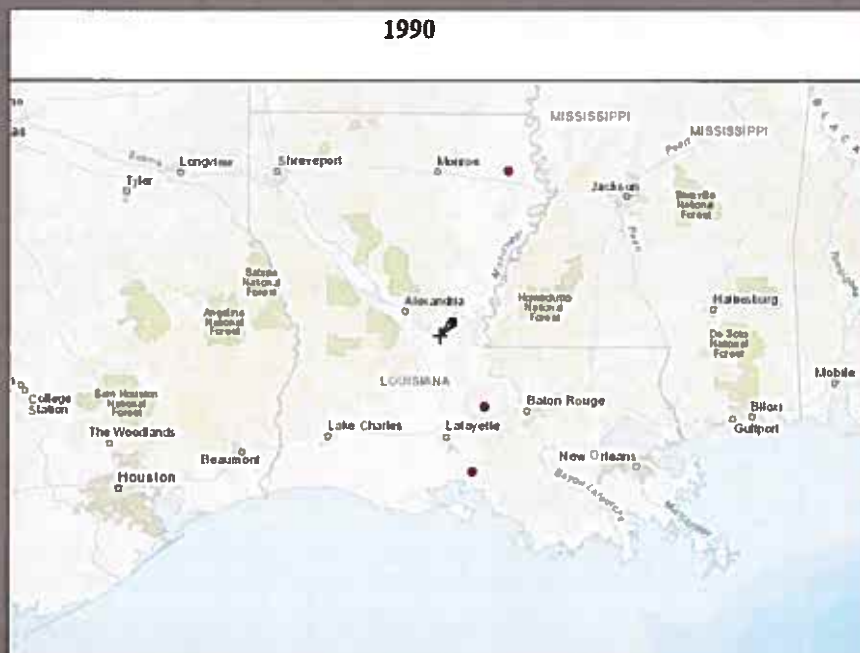
87 Females

Other monitoring

- Complaints
- Sightings
- Dead bears



Other monitoring



1988



Category 1

Questions

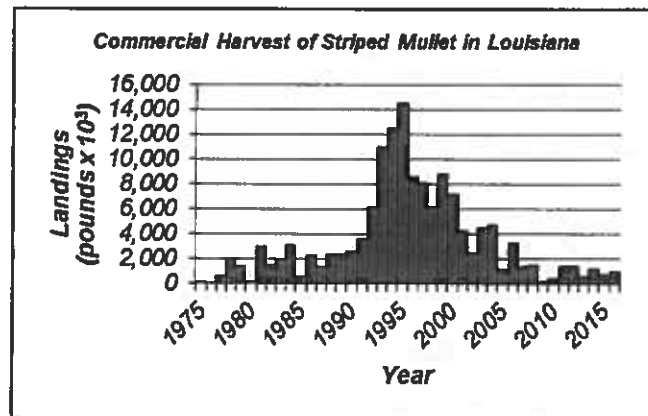


Update Assessment of Striped Mullet *Mugil cephalus* in Louisiana Waters 2018 Report

Executive Summary

Commercial landings of striped mullet *Mugil cephalus* in Louisiana have significantly decreased in the last 20 years, with the highest harvest observed in 1995. The passages of Hurricanes Katrina and Rita caused substantial reduction in the

directed effort of the commercial fleet when compared to previous years. Since 2007, annual harvest has remained below two-million pounds, with extremely low landings in 2009 and 2010. Since 2010, landings have increased, but remain at historically low levels. The marked decline in commercial landings since



2000 can be attributed to impacts from several hurricanes, increases in operating costs, increases in foreign wild-caught and aquaculture mullet production, and decreases in the demand and price of mullet roe.

A statistical catch at age model is used in this assessment to describe the dynamics of the Louisiana striped mullet stock (1996-2016). This model uses a maximum likelihood fitting criterion to project population size from abundance estimates in the initial year and recruitment estimates in subsequent years. Fishing mortality is estimated as year and age-specific components. Landings are taken from the Louisiana Department of Wildlife and Fisheries (LDWF) Trip Ticket Program and National Marine Fisheries Service commercial statistical records. Indices of abundance are developed from the LDWF fishery-independent marine gillnet survey. Age composition of fishery and survey catches are estimated with age-length keys developed from samples directly from the fishery and a von Bertalanffy growth function.

The conservation threshold established by the Louisiana Legislature for striped mullet is a 30% spawning potential ratio. Based on results of this assessment, the Louisiana striped mullet stock is currently neither overfished or experiencing overfishing. The current spawning potential ratio estimate is 52%.

Summary of Changes from 2017 Assessment

Assessment model inputs have been updated through 2016. No changes have been made to the assessment model itself.

**Update Assessment of Striped Mullet *Mugil cephalus* in Louisiana Waters
2018 Report**

Joe West
Office of Fisheries
Louisiana Department of Wildlife and Fisheries

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1. Introduction

A statistical catch-at-age model is used in this assessment to describe the dynamics of the Louisiana (LA) striped mullet *Mugil cephalus* (SM) stock. The assessment model forward projects annual abundance at age from estimates of abundance in the initial year of the time-series and recruitment estimates in subsequent years. The model is fit to the data with a maximum likelihood fitting criterion. Minimum data requirements are fishery catch-at-age and an index of abundance (IOA). Landings values are taken from the Louisiana Department of Wildlife and Fisheries (LDWF) Trip Ticket Program and the National Marine Fisheries Service (NMFS) commercial statistical records. Indices of abundance are developed from the LDWF experimental marine gillnet survey. Age composition of fishery and survey catches are estimated with age-length keys derived from samples directly of the fishery and a von Bertalanffy growth function.

1.1 Fishery Regulations

The LA SM fishery is governed by the Louisiana State Legislature, the Wildlife and Fisheries Commission and the LDWF. Louisiana commercial and recreational SM fishery regulations were reviewed in the 2014 assessment report (West *et al.* 2014); full descriptions of historical regulations can be found in Mapes *et al.* (2001) and GSMFC (1995).

1.2 Trends in Harvest

Time-series of commercial and recreational SM landings in the Gulf of Mexico are presented (Table 1, Figure 1). Trends in harvest were reviewed in the 2014 assessment report (West *et al.* 2014).

2. Data Sources

2.1 Fishery Independent

The LDWF conducts routine fishery-independent (FI) monitoring surveys across Louisiana's coastal zone to primarily measure relative abundance and size compositions of recreationally and commercially important marine species. For sampling purposes, coastal Louisiana is currently divided into five LDWF coastal study areas (CSAs). Current CSA definitions are as follows: CSA 1 – Mississippi State line to South Pass of the Mississippi River (Pontchartrain Basin); CSA 3 – South Pass of the Mississippi River to Bayou Lafourche (Barataria Basin); CSA 5 – Bayou Lafourche to eastern shore of Atchafalaya Bay

(Terrebonne Basin); CSA 6 – Atchafalaya Bay to western shore of Vermillion Bay (Vermillion/Teche/Atchafalaya Basins); CSA 7 – western shore of Vermillion Bay to Texas State line (Mermentau/Calcasieu/Sabine Basins).

The LDWF fishery-independent experimental marine gillnet survey is used in this assessment to develop indices of abundance for use in the statistical catch-at-age assessment model. This survey is conducted with standardized design and is one of the primary gears used to sample inshore finfish. The survey is conducted year-round. Sampling gear is a 750-foot long gillnet made up of equal sized panels of 2.0, 2.5, 3.0, 3.5, and 4.0 inch stretch meshes. Samples are taken by ‘striking’ the net; where the net is set either parallel to the shore (or reef) or set in a crescent-shape. The vessel is then maneuvered both inside and outside of the net in gradually tightening circles a minimum of three times to force fish into the net. All captured SM are enumerated and a maximum of 30 randomly selected SM per mesh panel are collected for length measurements, gender determination, and maturity information. When more than 30 SM are captured per mesh panel, catch-at-size is derived as the product of total catch and proportional subsample-at-size.

This survey was conducted from 1986 to April 2013 at fixed sampling stations within each CSA. The 2.5 and 3.5 inch mesh sizes, however, were not included in this survey until 1988. In October of 2010, additional fixed stations were added to the survey allowing more spatial coverage within CSAs. Beginning in April 2013, the survey design was modified where sampling locations are now selected randomly within each CSA. To alleviate time-series biases associated with the addition of these new stations and the changes in survey methodology, two discrete time-series of catch-rates were developed. The first or the “old” time-series (1988-2012) was developed by retaining long-term stations only for analyses (Figure 2). The second or the “new” time-series (2010-present) was developed by retaining all current sampling stations for analyses (Figure 2).

2.2 Fishery Dependent

Commercial

Commercial SM landings were taken from NMFS commercial statistical records (NMFS 2014a) and the LDWF Trip Ticket Program (Figure 1). Annual size composition of commercial catches (Table 2) were derived from the Trip Interview Program (TIPS; 1996-2001), the Fishery Information Network (FIN; 2007-2016), and by combination of data collection programs (TIPS+FIN; 2002-2006). Ages of commercial SM landings were derived from otoliths collected from LDWF sampling effort (see *Catch at Age Estimation*).

Recreational

As in prior assessments, the effects of recreational harvest on the stock were not considered. The MRFSS/MRIP harvest data indicates that LA recreational harvest is negligible relative to commercial harvest (Table 1; NMFS 2014b). Furthermore, only limited recreational size composition information is available from MRFSS/MRIP. The available size information indicates the recreational harvest is primarily taken at sizes (age-0) prior to entering the commercial fishery (age-1+).

3. Life History Information

3.1 Unit Stock Definition

Striped mullet are a catadromous schooling fish common in warm, temperate coastal waters throughout the world. They are ubiquitous in the Gulf of Mexico (GOM) and can be found along extreme salinity gradients, from fresh to hyper-saline. Little or no genetic sub-structuring has been documented for GOM striped mullet. Thompson *et al.* (1991) found no differences in enzyme polymorphisms in striped mullet collected from various locations across Louisiana, or between those areas and mullet collected from the Pascagoula River (Mississippi), Mobile Bay (Alabama), and Charleston Bay (South Carolina). Campton and Mahmoudi (1991) also found little evidence for genetic sub-structuring of striped mullet populations between the Atlantic and GOM coasts of Florida. For the purpose of this assessment, however, the unit stock is defined as those female SM occurring in LA waters. This approach is consistent with the current statewide management strategy.

3.2 Morphometrics

Weight-length regressions for LA SM were developed by Thompson *et al.* (1991). Regression equation slopes comparing males and females were not significantly different. For the purpose of this assessment, the non-sex-specific formulation was used with weight calculated from size as:

$$W = 2.1 \times 10^{-5}(FL)^{2.93} \quad [1]$$

where W is total weight in grams and FL is fork length in mm. Fish with only FL measurements available were converted to TL using the relationship provided by Thompson *et al.* (1991) where:

$$TL = 1.13 \times (FL) - 3.40 \quad [2]$$

3.3 Growth

Von Bertalanffy growth functions for female LA SM collected from fishery-independent data sources were developed by Thompson *et al.* (1991) with size-at-age calculated from:

$$FL_a = 471.70 \times (1 - e^{-0.28(a-0.03)}) \quad [3]$$

where FL_a is FL-at-age in mm and years.

3.4 Sex Ratio

The probability of being female at a specific size was estimated with a logistic function developed in an earlier assessment (West *et al.* 2014) as:

$$P_{fem,l} = \frac{1}{[1 + e^{[-0.24(TL - 10.04)]}]} \quad [4]$$

where $P_{fem,l}$ is the estimated proportion of females in 1 inch TL intervals. The minimum sex ratio-at-size was assumed as 50:50.

3.5 Fecundity/Maturity

Per capita fecundity functions for LA SM were developed by Thompson *et al.* (1991) with fecundity-at-size computed as:

$$f_l = 5.6 \times 10^{-3} (FL)^{3.18} \quad [5]$$

Where f_l is the average fecundity of a size l female in FL. Fecundity-at-age f_a was then computed by substituting equation [5] into equation [3]. Female SM maturity was assumed knife-edged at age-2.

3.6 Natural Mortality

Striped mullet can live to at least ten years of age (Thompson *et al.* 1991). For purposes of this assessment, an average value of \bar{M} was assumed (0.3), but was allowed to vary with weight-at-age to calculate a declining natural mortality rate with age. This average value of \bar{M} is consistent with a stock where approximately 1.5% of the population remains alive to 10 years of age (Hewitt and Hoenig 2005). Following SEDAR 12 (SEDAR 2006), the estimate was rescaled where the mean mortality rate over ages vulnerable to the fishery is equivalent to the average rate as:

$$M_a = \bar{M} \frac{nL(a)}{\sum_{a_c}^{a_{max}} L(a)} \quad [6]$$

Where \bar{M} is the average mortality rate over exploitable ages a , a_{max} is the oldest age-class, a_c is the first fully-exploited age-class, n is the number of exploitable ages, and $L(a)$ is the Lorenzen curve as a function of age. The Lorenzen curve as a function of age was calculated from:

$$L(a) = W_a^{-0.288} \quad [7]$$

where -0.288 is the allometric exponent estimated for natural ecosystems (Lorenzen 1996) and W_a is weight-at-age.

3.7 Relative Productivity / Resilience

The key parameter in age-structured population dynamics models is the steepness parameter (h) of the stock-recruitment relationship. Steepness is defined as the ratio of recruitment levels when the spawning stock is reduced to 20% of its unexploited level relative to the unexploited level and determines the degree of compensation in the population (Mace and Doonan 1988). Populations with higher steepness values are more resilient to perturbation and if the spawning stock is reduced to levels where recruitment is impaired are more likely to recover sooner once overfishing has ended. Generally, this parameter is difficult to estimate due to a lack of contrast in spawning stock size (*i.e.*, data not available at both high and low levels of stock size) and is typically fixed or constrained during the model fitting process. Estimates of steepness are not available for GOM striped mullet.

Productivity is a function of fecundity, growth rates, natural mortality, age of maturity, and longevity and can be a reasonable proxy for resilience. We characterize the relative productivity of LA SM based on life-history characteristics, following SEDAR 9, with a classification scheme developed at the FAO second technical consultation on the suitability of the CITES criteria for listing commercially-exploited aquatic species (FAO 2001; Table 3). Each life history characteristic (von Bertalanffy growth rate, age at maturity, longevity, and natural mortality rate) is assigned a rank (low=1, medium=2, and high=3) and then averaged to compute an overall productivity score. In this case, the overall productivity score is 2.5 for LA striped mullet indicating medium to high productivity and resilience.

4. Abundance Index Development

Striped mullet IOAs of the “old” and “new” time-series were developed from the LDWF experimental marine gillnet survey. Only those CSAs (1, 5, 6, and 7), months (November – February), and mesh panels (2.0, 2.5, 3.0, 3.5 inch) with $\geq 5\%$ positive samples (*i.e.*, non-zero catches) on average were included in IOA development. Samples collected during the months of January and February were grouped with the previous year’s November and December samples. Catch per unit effort is defined as the number of female striped mullet caught per net sample. The number of female mullet caught per gillnet sample was calculated from each samples catch at size and equation [4].

To reduce unexplained variability in catch rates unrelated to changes in abundance, each IOA was standardized using methods described below. A delta lognormal approach (Lo *et al.* 1992; Ingram *et al.* 2010) was used to standardize female SM catch-rates in each year as:

$$I_y = c_y p_y \quad [8]$$

where c_y are estimated annual mean CPUEs of non-zero catches modeled as lognormal distributions and p_y are estimated annual mean probabilities of capture modeled as binomial distributions. The lognormal

model considers only the positive samples; the binomial model considers all samples. The lognormal and binomial means and their standard errors were estimated with generalized linear mixed models as least square means and back transformed. Each IOA was then computed from equation [8] using the estimated least-squares means with variances calculated from:

$$V(I_y) \approx V(c_y)p_y^2 + c_y^2V(p_y) + 2c_y p_y \text{Cov}(c, p) \quad [9]$$

where $\text{Cov}(c, p) \approx \rho_{c,p} [SE(c_y)SE(p_y)]$ and $\rho_{c,p}$ represents the correlation of c and p among years.

Because of the designed nature of LDWF fishery-independent surveys, model development was rather straightforward. Variables considered in model inclusion were year, CSA, and sampling location. Because only seasonal samples were included in each IOA (i.e., November-February) time of year was not considered in model inclusion. To determine the most appropriate models, we began the model selection process with fully-reduced models that included only year as a fixed effect. More complex models were then developed including interactions and random effects and compared using Akaike information criterion (Akaike 1973) and log-likelihood values. All sub-models were estimated with the SAS generalized linear mixed modeling procedure (PROC GLIMMIX; SAS 2009). In the final sub-models, year was considered a fixed effect, CSA was considered a random block effect, and sampling locations within CSAs were considered random subsampling block effects. Fits of lognormal submodels were evaluated with conditional residual plots. Binomial submodels were evaluated for overdispersion via Pearson's chi-square per degree of freedom statistic (Stroup 2013).

Annual sample sizes, observed percent positive samples, nominal CPUEs, standardized IOAs, and corresponding coefficients of variation of the "old" and "new" time-series are presented (Table 4). Standardized IOAs and 95% confidence intervals of the "old" and "new" time-series are also presented graphically (Figure 3). Conditional residual plots of the lognormal sub-models indicate reasonable fits. Pearson's chi-square per degree of freedom statistics indicate no overdispersion in the binomial sub-models ("old" time-series=1.0; "new" time-series=0.8).

5. Catch at Age Estimation

Age-length-keys (ALKs) were developed to estimate the annual age composition of fishery and survey catches as described below.

5.1 Fishery

Only female SM otoliths collected from fishery-dependent sources were used in age assignments of fishery landings in this assessment. Ages were assigned by assuming a January 1st birthday, where SM

spawned the previous year become age-1 on January 1st and remain age-1 until the beginning of the following year.

Probabilities of age given length for annual fishery landings were computed as:

$$P(a|l)_y = \frac{n_{lay}}{\sum_a n_{lay}} \quad [10]$$

where n_{lay} are annual female SM sample sizes occurring in each length/age bin (Tables 5 and 6). Table 5 was used to calculate $P(a|l)_y$ for 1996-2002 landings, where limited annual sample sizes preclude use of annual ALKs. Annual fishery catch-at-age (females only) was then calculated as:

$$C_{ay} = \sum_l P_{fem,l} C_{ly} P(a|l)_y \quad [11]$$

where $P_{fem,l}$ is taken from equation [4], C_{ly} is annual fishery catch-at-size, and $P(a|l)_y$ are taken from equation [10]. Resulting annual fishery catch-at-age and associated mean weights-at-age are presented (Tables 7 and 8).

5.2 Survey

Probabilities of age given length for female SM catches of the experimental marine gillnet survey were computed as:

$$P(a|l) = \frac{P(l|a)}{\sum_a P(l|a)} \quad [12]$$

with the probability of length given age estimated from a normal probability density as:

$$P(l|a) = \frac{1}{\sigma_a \sqrt{2\pi}} \int_{l-d}^{l+d} \exp \left[-\frac{(l-l_a)^2}{2\sigma_a^2} \right] dl \quad [13]$$

where length bins are 1 inch TL intervals with midpoint l , maximum $l + d$, and minimum $l - d$ lengths. Mean length-at-age l_a was estimated from Equation [3]. The standard deviation in length-at-age was approximated from $\sigma_a = l_a CV_l$, where the coefficient of variation in length-at-age was assumed constant (in this case 0.05). To approximate changes in growth with the timing of the survey, mean l_a was calculated at the end of the calendar year (*i.e.*, age = $a + 1.0$). Resulting survey $P(a|l)$ is presented (Table 9). Annual survey female catch-at-age was also calculated from equation [11] with annual survey catch-at-size substituted for fishery catch-at-size. Annual survey catch-at-size was derived using only those samples included in abundance index development. Annual survey catch-at-size and resulting annual survey age compositions (females only) for the “old” and “new” time-series are presented (Tables 10-12).

6. Assessment Model

In this assessment update, the Age-Structured Assessment Program (ASAP3 Version 3.0.12; NOAA Fisheries Toolbox <http://nfl.nfsc.noaa.gov>) was used to describe the dynamics of the female proportion of the LA SM stock. ASAP is a statistical catch-at-age model that allows internal estimation of a Beverton-Holt stock recruitment relationship and MSY-related reference points. Minimum data requirements are fishery catch-at-age, corresponding mean weights-at-age, and a tuning index. ASAP projects abundance at age from estimates of abundance in the initial year of the time-series and recruitment estimates in subsequent years. The model is fit to the data with a maximum likelihood fitting criterion. An overview of the basic model configuration, equations, and their estimation, as applied in this assessment, are provided below. Specific details and full capabilities of ASAP can be found in the technical documentation (ASAP3; NOAA Fisheries Toolbox).

6.1 Model Configuration

The model was configured with annual time-steps (1996-2016) and a calendar year time frame. As in earlier assessments, only the years beginning in 1996 were modeled due to the limited information available from earlier years of the fishery. Since the commercial SM strike net fishery season runs from the 3rd Monday in October through the 3rd Monday of the following January, SM harvested in January were grouped with the previous year's landings for modeling purposes.

Mortality

Fishing mortality is assumed separable by age a and year y as:

$$F_{ay} = v_a Fmult_y \quad [14]$$

where v_a are fishery selectivities and $Fmult_y$ are fully-selected fishing mortality rates. Apical fishing mortality is estimated in the initial year and as deviations from the initial estimate in subsequent years.

Age-specific fishery selectivities are modeled with a single logistic function as:

$$v_a = \frac{1}{1 + e^{-(a-\alpha)/\beta}} \quad [15]$$

Total mortality for each age and year is estimated from the age-specific natural mortality rate M_a and estimated fishing mortalities as:

$$Z_{ay} = M_a + F_{ay} \quad [16]$$

For reporting purposes, annual fishing mortalities are averaged by weighting by estimated population abundance as:

$$F_y = \frac{\sum_a F_{ay} N_{ay}}{\sum_a N_{ay}} \quad [17]$$

Abundance

Abundance in the initial year of the time series and recruitment in subsequent years are estimated and used to forward calculate the remaining numbers at age from the age and year specific total mortality rates as:

$$N_{ay} = N_{a-1,y-1} e^{-Z_{a-1,y-1}} \quad [18]$$

Numbers in the plus group A are calculated from:

$$N_{Ay} = N_{A-1,y-1} e^{-Z_{A-1,y-1}} + N_{A,y-1} e^{-Z_{A,t-1}} \quad [19]$$

Stock Recruitment

Expected recruitment is calculated from the Beverton-Holt stock recruitment relationship, reparameterized by Mace and Doonan (1988), with annual lognormal deviations as:

$$\hat{R}_{y+1} = \frac{\alpha SS_y}{\beta + SS_y} + e^{\delta_{y+1}} \quad [20]$$

$$\alpha = \frac{4\tau(SS_0/SPR_0)}{5\tau-1} \quad \text{and} \quad \beta = \frac{SS_0(1-\tau)}{5\tau-1}$$

where SS_0 is unexploited spawning stock, SPR_0 is unexploited spawning stock per recruit, τ is steepness, and $e^{\delta_{y+1}}$ are annual lognormal recruitment deviations..

Spawning Stock

Spawning stock in each year is calculated from:

$$SS_y = \sum_{l=1}^A N_{ly} \Phi_{ly} e^{-Z_{ly}(0.0)} \quad [21]$$

where Φ_{ay} is per capita fecundity at age, and $-Z_{ay}(0.0)$ is the proportion of total mortality occurring prior to spawning on January 1st.

Catch

Expected fishery catches are estimated from the Baranov catch equation as:

$$\hat{C}_{ay} = N_{ay} F_{ay} \frac{(1-e^{-Z_{ay}})}{Z_{ay}} \quad [22]$$

Expected age composition of fishery catches are then calculated from $\frac{\hat{C}_{ay}}{\sum_a \hat{C}_{ay}}$. Expected yields are then computed as $\sum_a \hat{C}_{ay} \bar{W}_{ay}$, where \bar{W}_{ay} are observed mean catch weights.

Catch-rates

Expected survey catch-rates are computed from:

$$\hat{l}_{ay} = q \sum_a N_{ay} (1 - e^{-Z_{ay}(1.0)}) v_a \quad [23]$$

where v_a are the age-specific survey selectivities, q is the estimated catchability coefficient, and $-Z_{ay}(1.0)$ is the proportion of the total mortality occurring prior to the time of the survey (December 31st midpoint). Age-specific survey selectivities are modeled with a double logistic function as:

$$v_a = \left(\frac{1}{1 + e^{-(a-\alpha)/\beta}} \right) \left(1 - \frac{1}{1 + e^{-(a-\alpha_2)/\beta_2}} \right) \quad [24]$$

Expected survey age composition is then calculated as $\frac{\hat{l}_{ay}}{\sum_a \hat{l}_{ay}}$.

Parameter Estimation

The number of parameters estimated is dependent on the length of the time-series, number of fisheries and selectivity blocks modeled, and number of tuning indices modeled. Parameters are estimated in log-space and then back transformed. In this assessment, 61 parameters were estimated:

1. 10 selectivity parameters (2 for the fishery; 4 for each survey)
2. 21 apical fishing mortality rates (F_{mult} in the initial year and 20 deviations in subsequent years)
3. 21 recruitment deviations (1996-2016)
4. 6 initial population abundance deviations (age-2 through 7-plus)
5. 2 catchability coefficients (1 for each survey)
6. 1 stock-recruitment parameter (virgin stock size; the steepness parameter is fixed at 1.0 in the base run).

The model is fit to the data by minimizing the objective function:

$$-\ln(L) = \sum_i \lambda_i (-\ln L_i) + \sum_j (-\ln L_j) \quad [25]$$

where $-\ln(L)$ is the entire negative log-likelihood, $\ln L_i$ are log-likelihoods of lognormal estimations, λ_i are user-defined weights applied to lognormal estimations, and $\ln L_j$ are log-likelihoods of multinomial estimations.

Negative log-likelihoods with assumed lognormal error are derived (ignoring constants) as:

$$-\ln(L_i) = \ln(\sigma) + 0.5 \sum_i \frac{[\ln(obs_i) - \ln(pred_i)]^2}{\sigma^2} \quad [26]$$

where obs_i and $pred_i$ are observed and predicted values; standard deviations σ are user-defined coefficients of variation (CV) as $\sqrt{\ln(CV^2 + 1)}$.

Negative log-likelihoods with assumed multinomial error are derived (ignoring constants) as:

$$-\ln(L_j) = -ESS \sum_{i=1}^A p_i \ln(\hat{p}_i) \quad [27]$$

where p_i and \hat{p}_i are observed and predicted age composition. Effective sample-sizes (ESS) are used to create the expected numbers \hat{n}_a in each age bin and act as multinomial weighting factors.

6.2 Model Assumptions/Inputs

Model assumptions include: 1) the unit stock is adequately defined and closed to migration, 2) observations are unbiased, 3) errors are independent and their structures adequately specified, 4) fishery vulnerabilities are flat topped; survey vulnerabilities are dome-shaped, 5) abundance indices are proportional to absolute abundance, and 6) natural mortality, fecundity, growth and sex ratio at size/age do not vary significantly with time. Lognormal error distributions are assumed for catches, abundance indices, the stock-recruitment relationship, apical fishing mortality, selectivity parameters, initial abundance deviations, and catchability. Multinomial error distributions are assumed for fishery and survey age compositions.

The base model was defined with an age-7 plus group, steepness fixed at 1.0, one fishery selectivity block, one survey selectivity block for each time-series, and input levels of error and weighting factors as described as follows. Input levels of error for fishery landings were specified with CV's of 0.1 for each year of the time-series; annual recruitment deviations were specified with CV's of 0.5. All lambdas for lognormal components included in the objective function were equally weighted (=1). Input effective sample sizes (ESS) for estimation of fishery age compositions were specified as ESS=50 for years where annual ALKs were available (2003-2016) and down weighted to ESS=25 for years where the pooled ALK was used (1996-2002). Input effective sample size for estimation of survey age compositions, where ages were assigned from a von Bertalanffy growth function, were specified as ESS=10 for all years.

6.3 Model Results

Objective function components, weighting factors, and likelihood values of the base model are summarized in Table 13.

Model Fit

The base model provides an overall reasonable fit to the data. Predicted catches match the observations well. A residual pattern is apparent, however, where catch observations are generally underestimated in earlier years and overestimated in more recent years of the time-series (Figure 4). Predicted survey catch-rates also match the data well with no strong pattern in residuals, but fail to fit the high catch rate observed in 2005 and are generally underestimated before 2000 (Figures 5 and 6). Predicted fishery and survey age compositions provide reasonable fits to the input age proportions (Figures 7-9). However, the

predicted fishery age compositions overestimate the age-7-plus group input proportions in the most recent years of the time-series starting in 2013.

Selectivities

Estimated fishery and survey selectivities are presented in Figure 10. Fishery estimates indicate full-vulnerability to the commercial gill net fishery at age 5 with over 50% vulnerable at age 3. Survey estimates of the “old” and “new” time-series indicate full vulnerability to the FI survey gear at age 2.

Abundance, Recruitment, and Spawning Stock

Total stock size and abundance at age estimates from the base model are presented in Table 14. Stock size has varied over the time-series. Stock size decreased from 28.4 million females in 1996 to a minimum of 7.5 million females in 2009. Since 2009, stock size increased to a peak of 19.6 million females in 2016.

Recruitment estimates from the base model are presented in Figure 11. Recruitment has varied over the time-series. Age-1 recruit estimates decreased from 10.9 million fish in 1996 to 2.5 million age-1 fish in 2008. Since 2008, recruitment increased to a peak of 9.4 million age-1 fish estimated in 2012. The 2016 estimate of age-1 recruits is 7.1 million age-1 females.

Spawning stock estimates (total egg production) are presented in Figure 12. Spawning stock has varied over the time series with a decreasing trend in early years to an increasing trend in later years. Spawning stock decreased from 4.9 trillion eggs in 1996 to a minimum of 1.1 trillion eggs in 2007. Since 2007, the trend has generally been upward with an estimate of 2.1 trillion eggs in 2016.

Fishing Mortality

Estimated fishing mortality rates are presented in Table 15 (apical, average, and age-specific) and Figure 13 (average only). Average rates are weighted by population numbers at age. Average fishing mortality has varied over the time-series with an overall decreasing trend. The highest estimates of F were in earlier years of the time series with peaks observed in 1999 and 2004 (0.29 and 0.34 yr^{-1}). Since 2004, average fishing mortality rates decreased to a minimum of 0.01 yr^{-1} in 2009 and has remained low. The 2016 estimate of average F is 0.03 yr^{-1} .

Stock-Recruitment

No discernable relationship is observed between spawning stock and subsequent age-1 recruitment (Figure 14). The ASAP base models stock-recruitment relationship was run with steepness fixed at 1.0 and scaled to unexploited spawning stock. The unexploited spawning stock estimate was 7.3 trillion eggs and the corresponding unexploited recruitment was 5.4 million age-1 females. Alternate runs with steepness values fixed at 0.9, 0.8, and 0.6 are discussed in the *Model Diagnostics* Section below.

Parameter Uncertainty

In the ASAP base model, 61 parameters were estimated. Asymptotic standard errors for the time-series of age-1 recruits are presented in Figure 11. Markov Chain Monte Carlo derived confidence intervals (95%) for average fishing mortality rates and the spawning stock time-series are presented in Figures 12 and 13.

6.4 Management Benchmarks

The conservation standard established by the LA Legislature for striped mullet (RS 56:333) is a 30% spawning potential ratio (SPR; Goodyear 1993). Methodology used in this assessment to estimate equilibrium yield, spawning stock (total egg production), and average fishing mortality rates that lead to 30% SPR are described below. Current conditions are taken by averaging estimates from the final three years of the modeled time-series (2014-2016).

When the stock is in equilibrium, equation [21] can be solved, excluding the year index, for any given exploitation rate as:

$$\frac{SS}{R}(F) = \sum_{a=1}^A N_a \Phi_a e^{-Z_a(0.0)} \quad [28]$$

where total mortality at age Z_a is computed as $M_a + v_a F_{mult}$; vulnerability at age v_a is taken by rescaling the current F -at-age estimate (geometric mean 2014-2016) to the maximum. Per recruit abundance-at-age is estimated as $N_a = S_a$, where survivorship at age is calculated recursively from $S_a = S_{a-1} e^{-Z_a}$, $S_1 = 1$. Per recruit catch-at-age is then calculated with the Baranov catch equation [22], excluding the year index. Yield per recruit (Y/R) is then taken as $\sum_a C_a \bar{W}_a$ where \bar{W}_a are current mean fishery weights at age (arithmetic mean 2014-2016).

Equilibrium spawning stock SS_{eq} is calculated by substituting SS/R estimated from equation [28] into the Beverton-Holt stock recruitment relationship as $\alpha \times SS/R - \beta$. Equilibrium recruitment R_{eq} and yield Y_{eq} are then taken as $SS_{eq} \div SS/R$ and $Y/R \times R_{eq}$. Fishing mortality is averaged as $\sum_a F_a N_a / \sum_a N_a$. Equilibrium SPR is then computed as the ratio of SS/R when $F > 0$ to SS/R when $F = 0$.

As reference points to guide management, we estimate the average fishing mortality rate and spawning stock size that lead to a 30% SPR ($F_{30\%}$ and $SS_{30\%}$). Also presented are a plot of the stock recruitment data, equilibrium recruitment, and diagonals from the origin intersecting R_{eq} at the minimum and maximum spawning stock estimates of the time-series, corresponding with a minimum equilibrium SPR of 19% and a maximum of 66% (Figure 15). The current estimate of equilibrium SPR is 52%. Estimates of $F_{30\%}$ and $SS_{30\%}$ are also presented in Table 16.

6.5 Model Diagnostics

Sensitivity Analysis

A series of sensitivity runs are used to explore uncertainty in the base model's configuration. The ASAP base model was run with steepness fixed at 1.0. Alternate runs were conducted examining reference point estimates ($F_{30\%}$, $SS_{30\%}$, $Y_{30\%}$, $F_{\text{current}}/F_{30\%}$, and $SS_{\text{current}}/SS_{30\%}$) with steepness fixed at 0.9, 0.8 and 0.6. Current conditions are taken by averaging estimates from the final three years of the modeled time-series (2014-2016). Additional sensitivity runs were conducted by separately increasing the lognormal weighting factors of the catch and IOA components of the base models objective function (*i.e.*, lambdas increased from 1 to 5).

Results of the sensitivity analysis are presented in Table 17. Reference point estimates from all sensitivity runs with the exception of the run with steepness fixed at 0.6 indicate the fishery is currently operating below $F_{30\%}$. However, all sensitivity runs with the exception of the base run and the model run with up-weighted IOAs indicate the stock is currently below $SS_{30\%}$. Estimates of $F_{30\%}$ for each sensitivity run were similar in magnitude (0.15 yr⁻¹). Estimates of $SS_{30\%}$, and $Y_{30\%}$ for each sensitivity run varied in magnitude (1.0-2.2 trillion eggs, and 1.2-3.5 million pounds, respectively).

It's important to note that all sensitivity model runs indicating the stock is currently below $SS_{30\%}$ fail to adequately fit the "old" IOA time-series where model predictions of relative abundance are substantially overestimated in earlier years and substantially underestimated in more recent years. This lack of model fit of the IOA leads to estimates of a spawning stock that consistently declines through time and estimates of current stock status below $SS_{30\%}$. This is likely a result of modeling a "one-way-trip" (Hilborn and Walters 1992) where in this case is a time-series with continually declining fishery effort and landings (1996-2016). Future assessment efforts should prioritize reconstructing earlier size/age information of commercial striped mullet landings before the 1995 landings peak to allow a longer modeled time-series with periods of both low and high fishing effort and better contrast in spawning stock size (See *Research and Data Needs* Section).

Retrospective Analysis

A retrospective analysis was conducted by sequentially truncating the base model by a year (terminal years 2013-2016). Retrospective estimates of recruitment, $SS/SS_{30\%}$, and $F/F_{30\%}$ are presented in Figure 16, where $SS_{30\%}$ and $F_{30\%}$ are computed from the base model run. Estimated terminal year $SS/SS_{30\%}$, $F/F_{30\%}$, and recruitment differed from the full base run. Terminal year $SS/SS_{30\%}$ estimates indicate positive bias, where $SS/SS_{30\%}$ estimates decrease as more years are added to the model. Terminal year $F/F_{30\%}$ estimates indicate negative bias, where estimates increase as more years are added to the model. Terminal

year recruitment estimates indicate both positive and negative bias, but estimates generally decrease as more years are added to the model.

7. Stock Status

The history of the LA striped mullet stock relative to $F/F_{30\%}$ and $SS/SS_{30\%}$ is presented in Figure 17. Given the established conservation standard of 30% SPR, fishing mortality rates exceeding $F_{30\%}$ ($F/F_{30\%} > 1.0$) are defined as overfishing; spawning stock sizes below $SS_{30\%}$ ($SS/SS_{30\%} < 1.0$) are defined as the overfished condition.

Overfishing Status

Using results of the ASAP model presented in this assessment, the current estimate of $F/F_{30\%}$ is < 1.0 , suggesting the stock is currently not undergoing overfishing. However, the assessment model indicates that the stock did experience overfishing in earlier years of the time-series.

Overfished Status

The current estimate of $SS/SS_{30\%}$ is > 1.0 , suggesting the stock is currently not in an overfished state. However, the assessment model indicates that the stock was in an overfished state in earlier years of the time-series.

Control Rules

As specified in RS 56:333 (<http://www.legis.la.gov/Legis/Law.aspx?d=105230>), if the annual LDWF striped mullet stock assessment indicates that the current spawning potential ratio is $< 30\%$, the department shall close the season within two weeks for a period of at least one year.

8. Research and Data Needs

As with any analysis, the accuracy of this assessment is dependent on the accuracy of the information of which it is based. Mapes et al. (1998) identify several areas for research to address. Below we list additional recommendations to improve future LA stock assessments of striped mullet.

Only limited age data are available from the LDWF marine gillnet survey. Ages of survey catches in this assessment were assigned from a von Bertalanffy growth function. Age samples collected directly from the survey in question would allow a more accurate representation of survey age composition in future assessments.

An additional fishery-independent survey that effectively samples younger life-stages would allow for an index of abundance in future assessments that better characterizes year-class strength.

Methods to characterize fishery catch at size (age) for years prior to 1996 need to be examined. Inclusion of years prior to the 1995 peak in commercial striped mullet landings in the assessment model should provide better contrast in spawning stock size and allow more certainty in reference point estimation.

Factors that influence year-class strength of striped mullet are poorly understood. Investigation of these factors, including inter-annual variation in seasonal factors and the influence of environmental perturbations such as the Deepwater Horizon oil spill, could elucidate causes of inter-annual variation in abundance, as well as the species stock-recruitment relationship.

Fishery-dependent data alone is not a reliable source of information to assess status of a fish stock. Consistent fishery-dependent and fishery-independent data sources, in a comprehensive monitoring plan, are essential to understanding the status of fishery. A new LDWF fishery-independent survey methodology was implemented in 2013. This methodology should be assessed for adequacy with respect to its ability to evaluate stock status, and modified if deemed necessary.

With the recent trend toward ecosystem-based assessment models, more data is needed linking striped mullet population dynamics to environmental conditions. The addition of meteorological and physical oceanographic data coupled with food web data may lead to a better understanding of the striped mullet stock and its habitat.

9. References

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10. Tables

Table 1: Annual Louisiana commercial and recreational striped mullet *Mugil cephalus* landings (pounds x 10³) derived from NMFS statistical records, LDWF trip ticket program, and MRFSS/MRIP. Recreational landings are A+B1 catches only. Note: Louisiana MRIP estimates are not available after 2013.

Year	Harvest		% Recreational
	Commercial	Recreational	
1981	3,051	1	0.0%
1982	1,533	17	1.1%
1983	1,887	0	0.0%
1984	3,157	3	0.1%
1985	579	8	1.3%
1986	2,278	53	2.3%
1987	1,439	0	0.0%
1988	2,367	106	4.3%
1989	2,414	75	3.0%
1990	2,646	296	10.1%
1991	3,563	26	0.7%
1992	6,215	121	1.9%
1993	11,026	185	1.7%
1994	12,560	98	0.8%
1995	14,546	90	0.6%
1996	8,659	217	2.4%
1997	8,083	130	1.6%
1998	6,252	15	0.2%
1999	8,806	49	0.6%
2000	7,245	88	1.2%
2001	4,313	116	2.6%
2002	2,555	59	2.3%
2003	4,524	3	0.1%
2004	4,754	3	0.1%
2005	1,238	13	1.0%
2006	3,329	2	0.1%
2007	1,375	391	22.1%
2008	1,503	1	0.1%
2009	194	36	15.8%
2010	362	12	3.2%
2011	1,385	18	1.3%
2012	1,385	50	3.5%
2013	609	77	11.2%
2014	1,186	—	—
2015	692	—	—
2016	1,021	—	—

Table 2: Annual size frequency samples of Louisiana commercial striped mullet *Mugil cephalus* landings derived from the Trip Interview Program (TIPS; 1996-2001), the Fishery Information Network (FIN; 2007-2016), and by combination of data collection programs (TIPS+FIN; 2002-2006).

TL in	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
6																					
7																					
8																					
9																					
10	3																	2			
11	8	2	1										1					1			
12	59	44	1	10				3	1		10	8	7		1	1	1	8			2
13	271	183	5	20	1	3	11	30	22	11	25	25	35		26	22	19	38	11	12	5
14	518	537	45	37	9	20	37	101	88	61	53	78	103	1	50	39	45	131	73	32	29
15	401	595	73	114	40	41	49	142	122	151	107	194	150	10	23	40	112	255	139	91	55
16	308	453	110	244	83	40	53	169	267	182	164	256	155	49	41	94	153	276	262	224	85
17	202	230	126	248	87	75	31	151	342	154	135	187	160	165	33	254	260	181	115	266	95
18	121	108	94	259	73	41	7	110	209	117	117	127	106	215	34	330	244	43	17	118	65
19	61	36	36	148	43	18	4	36	58	19	47	74	37	134	6	118	63	5	1	18	37
20	14	14	6	49	16	1		8	20		15	12	18	79	1	19	5		1	12	28
21	6	3		13	2				2		1	2	1	20		3				4	16
22	2			2	1							1		6			2				2
23													1	1							
24	1																				
25																					
26																					
27	2																				
28																					
Totals	1977	2205	497	1144	355	239	192	750	1111	695	674	964	772	680	215	920	904	940	619	777	419

Table 3: FAO proposed guidelines for indices of productivity for exploited fish species.

Parameter	Productivity			Species	Score
	Low	Medium	High	Striped Mullet	
M	<0.2	0.2 - 0.5	>0.5	0.3	2
K	<0.15	0.15 - 0.33	>0.33	0.28	2
t _{mat}	>8	3.3 - 8	<3.3	2	3
t _{max}	>25	14 - 25	<14	10	3
Examples	orange roughy, many sharks	cod, hake	sardine, anchovy	Striped Mullet Productivity Score = 2.5 (med/high)	

Table 4: Annual sample sizes, proportion positive samples, nominal CPUEs, indices of abundance, and corresponding coefficients of variation of the "old" and "new" time-series derived from the LDWF fishery-independent marine gillnet survey. Nominal CPUEs and the indices of abundance have been normalized to their individual long-term means for comparison.

Year	Old IOA					New IOA				
	n	%Pos	CPUE	IOA	CV	n	%Pos	CPUE	IOA	CV
1988	229	20%	0.36	0.15	0.29	—	—	—	—	—
1989	243	19%	0.40	0.16	0.29	—	—	—	—	—
1990	253	20%	0.49	0.19	0.29	—	—	—	—	—
1991	257	19%	0.58	0.19	0.29	—	—	—	—	—
1992	175	21%	0.56	0.21	0.29	—	—	—	—	—
1993	172	20%	0.51	0.19	0.30	—	—	—	—	—
1994	167	22%	1.08	0.22	0.29	—	—	—	—	—
1995	133	27%	1.40	0.31	0.28	—	—	—	—	—
1996	136	18%	0.29	0.12	0.32	—	—	—	—	—
1997	144	18%	1.64	0.27	0.31	—	—	—	—	—
1998	148	22%	0.72	0.23	0.29	—	—	—	—	—
1999	148	15%	0.58	0.12	0.33	—	—	—	—	—
2000	141	18%	0.78	0.23	0.31	—	—	—	—	—
2001	148	16%	0.88	0.14	0.32	—	—	—	—	—
2002	148	19%	0.57	0.16	0.31	—	—	—	—	—
2003	148	16%	0.65	0.15	0.32	—	—	—	—	—
2004	149	20%	0.58	0.19	0.30	—	—	—	—	—
2005	141	23%	0.86	0.30	0.29	—	—	—	—	—
2006	148	18%	0.82	0.19	0.31	—	—	—	—	—
2007	146	20%	0.72	0.22	0.30	—	—	—	—	—
2008	148	17%	0.53	0.17	0.32	—	—	—	—	—
2009	145	16%	0.42	0.11	0.33	—	—	—	—	—
2010	139	18%	1.13	0.23	0.32	307	15%	0.66	0.15	0.36
2011	140	19%	0.52	0.17	0.31	328	17%	0.45	0.17	0.35
2012	138	19%	0.41	0.15	0.31	315	16%	0.32	0.13	0.36
2013	—	—	—	—	—	150	16%	0.43	0.17	0.38
2014	—	—	—	—	—	150	13%	0.36	0.12	0.40
2015	—	—	—	—	—	152	12%	0.15	0.08	0.40
2016	—	—	—	—	—	151	14%	0.33	0.10	0.39

Table 5: Length-at-age samples used for age assignments of commercial striped mullet *Mugil cephalus* landings 1996-2002 (females only).

TL in	1996-2002										Total
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	
8											
9											
10											
11											
12		4	2	1							7
13		21	27	6	1						55
14		28	65	35	4	1		1			134
15	2	28	43	28	6	4	1				112
16	1	18	29	20	8	2					78
17		7	34	15	6	5	2				69
18		3	23	21	9	2					58
19		1	8	11	7	3	1				31
20				2	4	2		1			9
21			1	1	1		1	1			5
22											
23											
24											
25											
26											
Total	3	110	232	140	46	19	5	3	0	0	558

Table 6: Annual length-at-age samples for age assignments of commercial striped mullet *Mugil cephalus* landings 2003-2016 (females only).

2003											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12		1	1	1							3
13		13	3	4	3						23
14		9	18	17	6						50
15		6	34	18	4	1					63
16		3	37	38	20	3					101
17		4	17	40	29	6		1			97
18		1	8	20	26	4	8	2			69
19		3	5	6	8	6	3				31
20				2	1	2	1				6
21											
22											
23											
24											
25											
26											
Total	0	40	123	146	97	22	12	3	0	0	443

2004											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13		1	4								5
14		2	10	4	3	2					21
15		6	28	12	5	3					54
16		5	24	33	13	8					83
17		2	37	58	32	9					138
18			14	47	34	27	1				123
19			2	10	15	9	3				39
20				2	6	4	1				13
21						1					1
22											
23											
24											
25											
26											
Total	0	16	119	166	108	63	5	0	0	0	477

2005											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13	1	1	1								3
14		18	4	7	4						33
15		53	34	41	12						140
16		14	50	69	30	11	2				176
17		4	35	62	36	8	6				151
18			8	49	37	16	5	1			116
19				2	9	2	4				17
20											
21											
22											
23											
24											
25											
26											
Total	1	90	132	230	128	37	17	1	0	0	636

Table 6 (continued):

2006											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13		5	3	2	1						11
14	1	2	5	4	4						16
15		22	27	13	20	3	1				86
16		22	39	42	33	8	1				145
17		11	35	31	33	14	2	2			128
18		1	18	44	35	9	3				110
19				13	17	11	3	2			46
20					5	3	5				13
21								1			1
22											
23											
24											
25											
26											
Total	1	63	127	149	148	48	15	5	0	0	556

2007											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12		2	1	2		1					5
13	1	6	3		1	1					12
14	1	17	12	6	3	2					41
15	2	51	48	15	13	6					135
16		48	71	55	22	21	1			1	219
17		10	48	48	32	27	6				171
18	1	3	12	31	30	27	6	3			113
19	1	1	1	9	22	21	9				64
20				1	2	3	2	1	1		10
21		1	1								2
22						1					1
23											
24											
25											
26											
Total	6	139	197	167	125	109	24	4	1	1	773

2008											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12		1	2	1							4
13		4	17	6	1						28
14		4	55	26	2						87
15		9	93	19	6	2					129
16	1	8	84	36	4	4	1				138
17		1	73	43	16	6	2				141
18			33	37	7	10	2	1			90
19			9	7	10	5					31
20			3	3	2	3	1	2			14
21			1								1
22											
23			1								1
24											
25											
26											
Total	1	27	371	178	48	30	6	3	0	0	664

Table 6 (continued):

2009											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13											
14											
15		1									1
16			3	4							7
17	1	2	25	17	4	1					50
18		1	15	45	4	1	1				67
19			2	25	5	3	1				36
20				9	8	1					18
21				2	1	3	2	1			9
22		1						2			3
23											
24											
25											
26											
Total	1	5	45	102	22	9	4	3	0	0	191

2010											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12					1						1
13		1	9	11	4	1					26
14		4	18	15	12	1					50
15			3	15	5						23
16		2	11	22	4	2					41
17			5	18	9	1					33
18				12	18	3		1			34
19					6						6
20						1					1
21											
22											
23											
24											
25											
26											
Total	0	7	46	93	59	9	0	1	0	0	215

2011											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13	1	8	3								12
14		9	8	3	1						21
15		2	5	7	5		1				20
16		1	16	15	30	4	1	1			68
17		1	18	48	103	22	3	1			196
18		1		21	140	91	15	1			269
19			2	4	29	54	9				98
20					6	9	2				17
21				1		1					2
22											
23											
24											
25											
26											
Total	1	22	52	99	314	181	31	3	0	0	703

Table 6 (continued):

2012											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13		3	1		1	1					6
14	1	15	16	5	1		1				39
15		29	47	14	9	5	2				106
16		7	55	37	21	12	6				138
17		3	24	69	60	49	10				215
18			4	23	39	96	31	1	1		195
19				1	6	17	18	2			44
20						1	2				3
21											
22			1								1
23											
24											
25											
26											
Totals	1	57	148	149	137	181	70	3	1	0	747

2013											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10			1								1
11											
12			1								1
13		6	1	3							10
14		31	17	1	2						51
15		53	61	21	6	1					142
16		15	67	34	11	5	2				134
17		5	28	40	18	5	4				100
18			4	16	10	5	3				38
19					2	2	1				5
20											
21											
22											
23											
24											
25											
26											
Totals	0	110	180	115	49	18	10	0	0	0	482

2014											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13		5	6								11
14		17	47	7	1						72
15		18	96	23	1						138
16		7	177	66	10						260
17		3	55	40	10	3	2	1			114
18			6	5	3	2		1			17
19				1							1
20			1								1
21											
22											
23											
24											
25											
26											
Totals	0	50	388	142	25	5	2	2	0	0	614

Table 6 (continued):

2015											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12											
13		3	1	3	2						9
14		8	4	11	5	1					29
15		32	16	37	4						89
16		41	62	105	12	2					222
17		6	70	152	33	1					262
18		2	20	78	15	1					116
19		1	3	11	2	1					18
20			3	8	1						12
21			1	1	2						4
22											
23											
24											
25											
26											
Totals	0	93	180	406	76	6	0	0	0	0	761

2016											
TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Total
8											
9											
10											
11											
12		1	1								2
13		1	1	1	1	1					5
14	1	14	8	1	2	1	1				28
15		32	15	7	1						55
16		44	22	3	12	2					83
17		22	44	13	12	3					94
18		12	23	17	12	1					65
19		4	11	9	13						37
20			10	8	9	1					28
21			4	5	7						16
22		1	1								2
23											
24											
25											
26											
Totals	1	131	140	64	69	9	1	0	0	0	415

Table 7: Commercial striped mullet *Mugil cephalus* catch-at-age and yield (females only).

Year	Commercial Catch-at-age (Females only)							Yield (lbs)
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	
1996	27,596	1,059,061	2,014,009	1,150,059	337,810	139,953	50,207	6,877,195
1997	32,981	949,646	1,822,990	1,072,076	309,034	132,590	41,343	6,304,535
1998	15,061	418,799	1,158,810	778,530	313,266	135,508	38,239	5,183,043
1999	16,408	475,931	1,426,793	1,069,842	522,937	215,276	83,930	7,562,303
2000	14,841	386,358	1,173,353	868,556	424,025	181,451	63,282	6,148,075
2001	10,031	286,125	834,342	539,097	209,687	98,324	29,004	3,630,090
2002	11,128	280,941	575,874	340,062	103,301	46,247	12,795	2,065,852
2003		184,997	661,838	746,725	480,523	103,494	72,363	3,812,451
2004		85,557	595,246	775,332	468,445	256,942	16,891	4,040,779
2005	142	90,735	120,764	210,736	118,955	33,831	16,838	1,010,220
2006	6,959	189,581	372,753	419,155	414,130	124,908	50,505	2,814,151
2007	5,804	126,577	168,121	138,190	104,655	89,086	25,210	1,150,464
2008	1,097	30,298	411,547	202,672	56,949	36,074	10,970	1,277,838
2009	298	1,301	15,060	34,137	7,834	2,837	1,481	146,197
2010		6,014	38,908	81,850	52,599	7,387	1,094	297,373
2011	957	22,052	47,948	85,122	261,010	147,060	28,357	1,210,446
2012	713	44,739	112,919	123,931	119,756	163,971	68,030	1,196,454
2013		77,683	119,377	73,947	29,743	10,246	5,875	484,546
2014		48,504	393,833	147,094	26,306	5,422	4,323	974,181
2015		38,280	78,503	172,746	32,834	3,393		588,534
2016	967	135,523	150,043	70,652	76,355	9,822	1,648	882,865

Table 8: Mean weight-at-age (pounds) of commercial striped mullet *Mugil cephalus* landings (females only).

Year	Commercial Mean Weight-at-age (Females only)						
	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+
1996	1.43	1.23	1.39	1.52	1.83	1.84	2.05
1997	1.43	1.30	1.41	1.49	1.73	1.74	1.86
1998	1.47	1.56	1.77	1.87	2.05	2.02	2.06
1999	1.50	1.62	1.89	2.04	2.27	2.25	2.63
2000	1.49	1.67	1.89	2.02	2.24	2.23	2.49
2001	1.45	1.58	1.78	1.86	2.02	1.97	1.98
2002	1.45	1.40	1.49	1.54	1.69	1.71	1.70
2003		1.35	1.53	1.69	1.87	2.14	2.31
2004		1.43	1.62	1.87	2.00	2.04	2.63
2005	0.89	1.31	1.61	1.75	1.89	1.99	2.15
2006	1.10	1.42	1.62	1.83	1.89	2.11	2.40
2007	1.51	1.41	1.58	1.80	1.98	2.04	2.38
2008	1.60	1.29	1.60	1.76	2.02	2.19	2.38
2009	1.89	2.13	2.02	2.33	2.63	2.78	3.06
2010		1.21	1.30	1.56	1.82	1.79	2.32
2011	0.89	1.15	1.58	1.87	2.08	2.32	2.26
2012	1.10	1.31	1.55	1.83	1.96	2.12	2.25
2013		1.27	1.50	1.67	1.77	1.88	1.89
2014		1.29	1.53	1.65	1.77	2.03	1.98
2015		1.50	1.80	1.86	1.90	1.99	
2016	1.10	1.64	2.00	2.26	2.32	1.90	2.27

Table 9: Probabilities of age given length for age assignments of female striped mullet *Mugil cephalus* catches from the LDWF fishery-independent marine gillnet survey.

TL in	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+
6	1.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	1.00	0.00	0.00	0.00	0.00	0.00
11	0.00	1.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.81	0.19	0.00	0.00	0.00	0.00
13	0.00	0.01	0.96	0.03	0.00	0.00	0.00
14	0.00	0.00	0.89	0.30	0.01	0.00	0.00
15	0.00	0.00	0.07	0.74	0.17	0.02	0.00
16	0.00	0.00	0.00	0.31	0.48	0.16	0.05
17	0.00	0.00	0.00	0.02	0.31	0.34	0.33
18	0.00	0.00	0.00	0.00	0.05	0.20	0.76
19	0.00	0.00	0.00	0.00	0.00	0.04	0.96
20	0.00	0.00	0.00	0.00	0.00	0.00	1.00
21	0.00	0.00	0.00	0.00	0.00	0.00	1.00
22	0.00	0.00	0.00	0.00	0.00	0.00	1.00

Table 10: Annual female striped mullet *Mugil cephalus* catch-at-size of the "old" time-series derived from the LDWF fishery-independent marine gillnet survey.

TL in / Year	1996	1997	1998	1999	2000	2001	2001	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
5		1															
6													1				
7	2	2	6	8	2	63	16	20	3	5	8	8	19	7	9	24	6
8	25	32	43	94	26	124	87	83	32	52	119	99	63	30	103	87	50
9	16	23	43	47	27	37	37	47	23	38	47	57	23	21	75	24	23
10	24	91	88	42	97	111	46	95	65	106	103	83	58	66	206	35	40
11	16	179	44	38	58	87	23	66	43	63	84	50	37	57	91	25	42
12	21	298	56	56	64	60	26	26	58	94	49	53	62	35	97	36	43
13	23	156	57	30	54	17	35	23	36	62	31	30	31	14	28	29	13
14	13	75	37	15	45	10	36	14	25	41	25	20	13	11	10	14	4
15	9	37	14	6	37	9	22	8	18	20	15	15	4	2	8	9	3
16	5	30	19	4	23	3	8	2	24	3		4	1	1	3	7	1
17	1	20	19	1	3	1			13	2	1		1			2	
18	1	3	2		1		3		4	2	1	1		1			
19		1	1	1	1				1								
20	1				1												
21																	1
22																	
Totals	156	946	428	343	438	521	339	386	344	486	483	419	312	243	630	292	227

Table 11: Annual female striped mullet *Mugil cephalus* catch-at-size of the “new” time-series derived from the LDWF fishery-independent marine gillnet survey.

TL in / Year	2010	2011	2012	2013	2014	2015	2016
5							
6							1
7	19	45	17	2	8	2	14
8	153	146	83	14	43	14	73
9	97	46	47	18	17	10	20
10	254	72	82	46	32	15	31
11	111	55	62	64	25	14	24
12	116	76	63	53	37	18	12
13	32	67	29	31	26	10	6
14	13	39	13	18	18	4	6
15	9	25	3	10	9	6	7
16	5	10	2	5	2	2	2
17		3	1				1
18		1					
19	1						
20							
21			1				
22							
Totals	811	585	402	257	217	92	197

Table 12: Annual female striped mullet survey age composition and sample sizes of the “old” and “new” time-series derived from the LDWF fishery-independent marine gillnet survey.

Year	Old IOA								New IOA							
	n	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	n	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+
1996	156	0.27	0.37	0.23	0.08	0.03	0.01	0.01	--	--	--	--	--	--	--	--
1997	946	0.06	0.54	0.28	0.07	0.03	0.01	0.01	--	--	--	--	--	--	--	--
1998	428	0.21	0.41	0.21	0.07	0.04	0.02	0.02	--	--	--	--	--	--	--	--
1999	343	0.44	0.36	0.15	0.03	0.01	0.00	0.01	--	--	--	--	--	--	--	--
2000	438	0.13	0.47	0.22	0.11	0.04	0.01	0.01	--	--	--	--	--	--	--	--
2001	521	0.43	0.47	0.07	0.02	0.01	0.00	0.00	--	--	--	--	--	--	--	--
2002	339	0.41	0.27	0.19	0.09	0.02	0.01	0.01	--	--	--	--	--	--	--	--
2003	386	0.39	0.47	0.10	0.03	0.01	0.00	0.00	--	--	--	--	--	--	--	--
2004	344	0.17	0.45	0.19	0.09	0.06	0.03	0.03	--	--	--	--	--	--	--	--
2005	488	0.19	0.50	0.22	0.06	0.01	0.00	0.00	--	--	--	--	--	--	--	--
2006	483	0.36	0.47	0.12	0.04	0.01	0.00	0.00	--	--	--	--	--	--	--	--
2007	419	0.39	0.42	0.13	0.05	0.01	0.00	0.00	--	--	--	--	--	--	--	--
2008	312	0.34	0.46	0.18	0.03	0.00	0.00	0.00	--	--	--	--	--	--	--	--
2009	243	0.23	0.62	0.12	0.02	0.00	0.00	0.00	--	--	--	--	--	--	--	--
2010	630	0.30	0.60	0.08	0.02	0.00	0.00	0.00	811	0.33	0.57	0.08	0.02	0.01	0.00	0.00
2011	292	0.46	0.30	0.16	0.05	0.02	0.01	0.00	585	0.41	0.32	0.18	0.05	0.02	0.01	0.00
2012	227	0.35	0.51	0.11	0.02	0.00	0.00	0.00	402	0.36	0.48	0.12	0.02	0.01	0.00	0.00
2013	--	--	--	--	--	--	--	--	257	0.12	0.59	0.20	0.05	0.02	0.00	0.00
2014	--	--	--	--	--	--	--	--	217	0.31	0.40	0.21	0.05	0.01	0.00	0.00
2015	--	--	--	--	--	--	--	--	92	0.28	0.45	0.17	0.07	0.02	0.01	0.00
2016	--	--	--	--	--	--	--	--	197	0.55	0.33	0.07	0.04	0.01	0.00	0.00

Table 13: Summary of objective function components and negative log-likelihood values of the ASAP base model.

Objective function =1807			
Component	Lambda	ESS	Obj fun
Catch_Fleet_Total	1		-46.2
Index_Fit_Total	2		5.4
Catch_Age_Comps		875	1338.3
Index_Age_Comps		240	315.8
Recruit devs	1		-6.0

Table 14: Annual female striped mullet abundance-at-age and stock size estimates from the ASAP base model.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	Totals
1996	10,943,500	8,022,360	5,696,740	2,523,900	816,190	302,142	134,441	28,439,273
1997	9,045,230	6,655,590	4,953,210	2,342,710	792,120	252,459	137,832	24,179,151
1998	7,351,520	5,501,710	4,115,320	2,054,690	745,188	248,459	125,011	20,141,898
1999	8,414,560	4,480,410	3,488,320	1,982,100	823,487	297,290	152,229	19,638,396
2000	7,512,320	5,113,280	2,737,440	1,347,690	564,787	230,350	128,340	17,634,207
2001	6,928,260	4,562,440	3,101,890	1,013,630	359,598	147,544	95,639	16,209,001
2002	6,073,370	4,219,590	2,868,110	1,419,770	375,448	132,159	91,345	15,179,792
2003	3,590,530	3,707,990	2,735,900	1,577,980	699,102	185,572	113,024	12,610,098
2004	3,346,410	2,186,920	2,332,830	1,258,180	588,769	258,894	113,002	10,085,005
2005	3,031,810	2,035,040	1,348,890	953,576	391,209	180,353	116,267	8,057,145
2006	5,447,110	1,853,000	1,337,420	804,233	531,717	220,077	170,761	10,364,318
2007	4,251,210	3,309,220	1,128,590	507,122	222,617	144,317	108,367	9,671,443
2008	2,499,830	2,594,290	2,133,010	599,499	236,502	103,983	120,759	8,287,873
2009	2,523,470	1,526,430	1,684,880	1,185,170	299,736	118,767	115,623	7,454,076
2010	2,838,000	1,545,610	1,030,670	1,179,940	847,705	218,496	175,164	7,835,585
2011	4,692,580	1,737,630	1,038,870	702,464	809,259	591,522	281,437	9,853,762
2012	9,368,390	2,868,460	1,144,110	626,338	398,514	463,503	511,332	15,380,647
2013	4,574,340	5,724,920	1,881,380	674,074	342,879	219,933	551,249	13,968,775
2014	6,627,430	2,799,900	3,833,220	1,253,350	446,271	230,626	532,815	15,723,612
2015	9,245,260	4,055,160	1,866,510	2,487,850	796,937	287,815	505,607	19,245,139
2016	7,127,910	5,660,270	2,723,480	1,266,180	1,693,910	551,901	564,024	19,587,675

Table 15: Annual female striped mullet age-specific, apical, and average fishing mortality rates estimated from the ASAP base model.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+	Fmult	Avg. F
1996	0.01	0.09	0.55	0.85	0.88	0.89	0.89	0.89	0.25
1997	0.01	0.09	0.54	0.84	0.87	0.87	0.87	0.87	0.26
1998	0.01	0.07	0.39	0.60	0.63	0.63	0.63	0.63	0.20
1999	0.01	0.10	0.61	0.95	0.98	0.99	0.99	0.99	0.29
2000	0.01	0.11	0.65	1.01	1.05	1.06	1.06	1.06	0.27
2001	0.01	0.07	0.44	0.68	0.71	0.71	0.71	0.71	0.18
2002	0.00	0.04	0.26	0.40	0.41	0.42	0.42	0.42	0.12
2003	0.01	0.07	0.44	0.68	0.70	0.71	0.71	0.71	0.26
2004	0.01	0.09	0.55	0.86	0.89	0.90	0.90	0.90	0.34
2005	0.00	0.03	0.18	0.27	0.29	0.29	0.29	0.29	0.09
2006	0.01	0.11	0.63	0.97	1.01	1.02	1.02	1.02	0.27
2007	0.00	0.05	0.29	0.45	0.47	0.47	0.47	0.47	0.10
2008	0.00	0.04	0.25	0.38	0.40	0.40	0.40	0.40	0.13
2009	0.00	0.00	0.02	0.03	0.03	0.03	0.03	0.03	0.01
2010	0.00	0.01	0.04	0.07	0.07	0.07	0.07	0.07	0.03
2011	0.00	0.03	0.17	0.26	0.27	0.27	0.27	0.27	0.09
2012	0.00	0.03	0.19	0.29	0.30	0.31	0.31	0.31	0.06
2013	0.00	0.01	0.07	0.10	0.11	0.11	0.11	0.11	0.03
2014	0.00	0.02	0.09	0.14	0.15	0.15	0.15	0.15	0.05
2015	0.00	0.01	0.05	0.07	0.08	0.08	0.08	0.08	0.02
2016	0.00	0.01	0.05	0.08	0.08	0.08	0.08	0.08	0.03

Table 16: Limit reference point estimates for the Louisiana striped mullet stock. Spawning stock units are eggs x 10¹². Fishing mortality units are yr⁻¹.

Reference Points		
Parameter	Derivation	Value
SPR _{lim}	RS 56:333	30%
F _{30%SPR}	Equation 28 and SPR _{lim}	0.15
SS _{30%SPR}	Equation 28 and SPR _{lim}	2.24

Table 17: Sensitivity analysis table. Current estimates are geometric means of 2014-2016 estimates. Yield units are pounds ($\times 10^3$), fishing mortality units are yr^{-1} , and spawning stock units are eggs $\times 10^{12}$.

Run #	Model run	negLL	Yield _{30%SPR}	F _{30%SPR}	SS _{30%SPR}	F _{current} /F _{30%SPR}	SS _{current} /SS _{30%SPR}
LA SM-00	Base Model	1607.4	2,547	0.15	2.24	0.20	1.72
LA SM-01	$h=.9$	1607.0	1,613	0.15	1.42	0.71	0.64
LA SM-02	$h=.8$	1604.1	1,482	0.15	1.30	0.96	0.54
LA SM-03	$h=.6$	1597.4	1,185	0.15	1.04	1.41	0.51
LA SM-04	Yield lambda (x5)	1420.0	1,775	0.15	1.56	0.48	0.85
LA SM-05	Survey lambda (x5)	1570.8	3,533	0.15	3.11	0.16	2.36

11. Figures

Figure 1: Reported commercial striped mullet *Mugil cephalus* landings (pounds $\times 10^3$) of the Gulf of Mexico derived from NMFS statistical records and the LDWF trip ticket program.

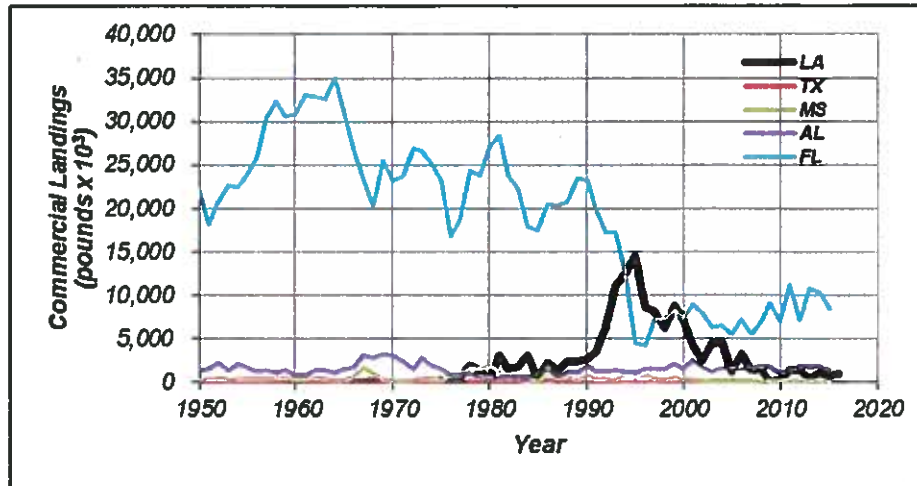


Figure 2: Station locations of the LDWF experimental marine gillnet survey. Yellow lines delineate LDWF Coastal Study Areas. Red circles represent long-term stations; green circles represent stations added in October 2010.



Figure 3: Standardized striped mullet indices of abundance, nominal catch-per-unit-effort, and 95% confidence intervals of the standardized indices derived from the LDWF marine gillnet survey. Each time-series has been normalized to its individual long-term mean for comparison. Top graphic depicts the “old” time-series. Bottom graphic depicts the “new” time-series.

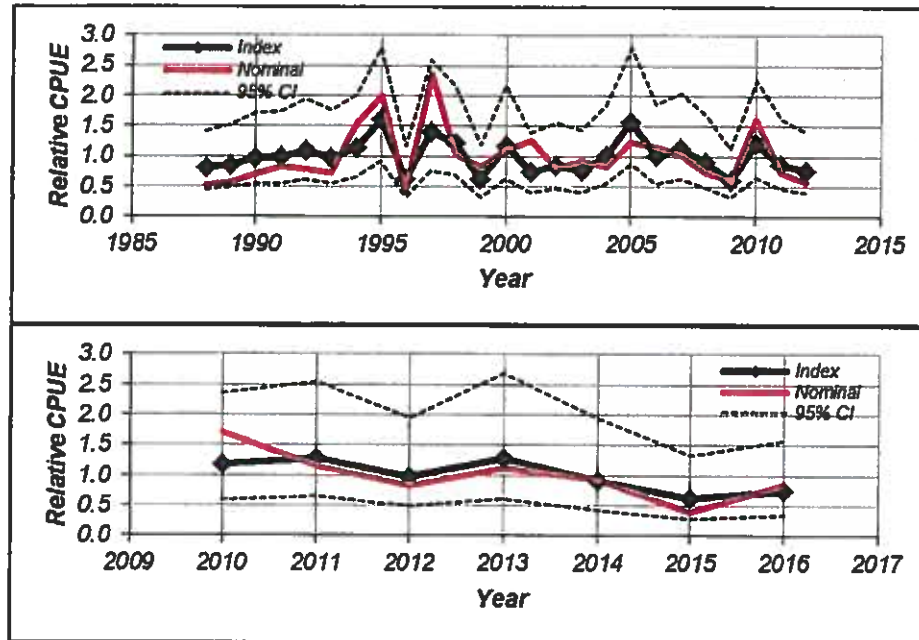


Figure 4: Observed and ASAP base model estimated commercial yield (females only; top) and standardized residuals (bottom).

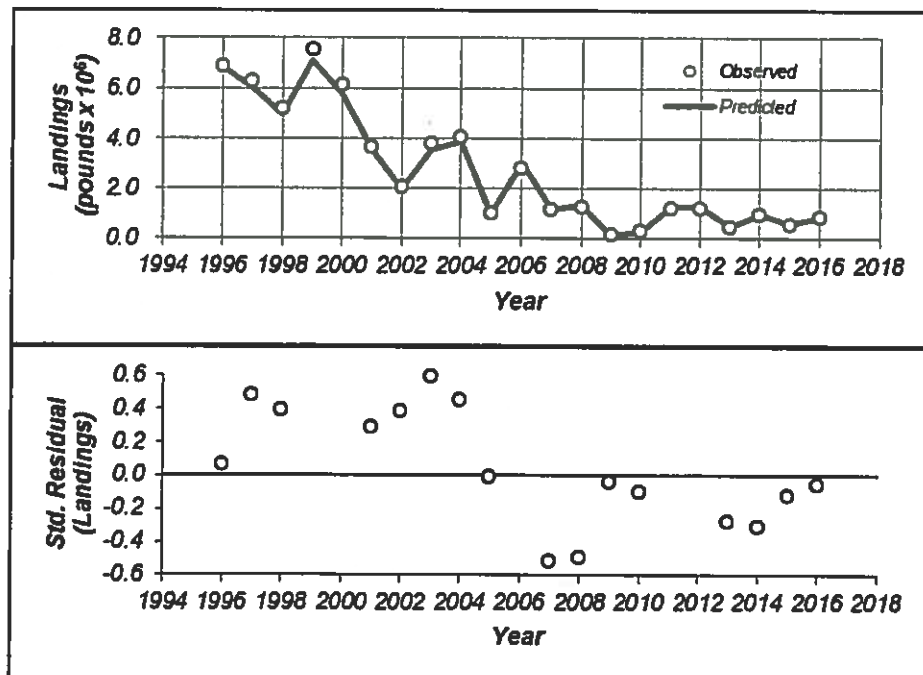


Figure 5: Observed and ASAP base model estimated fishery-independent CPUE (females only, top) and standardized residuals (bottom) of the “old” time-series.

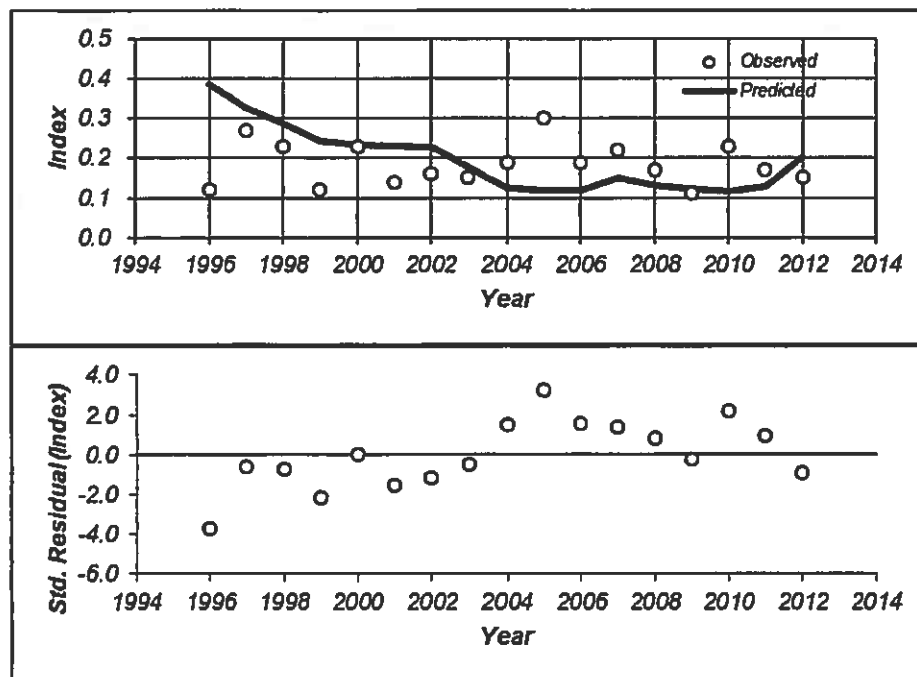


Figure 6: Observed and ASAP base model estimated fishery-independent CPUE (females only, top) and standardized residuals (bottom) of the “new” time-series.

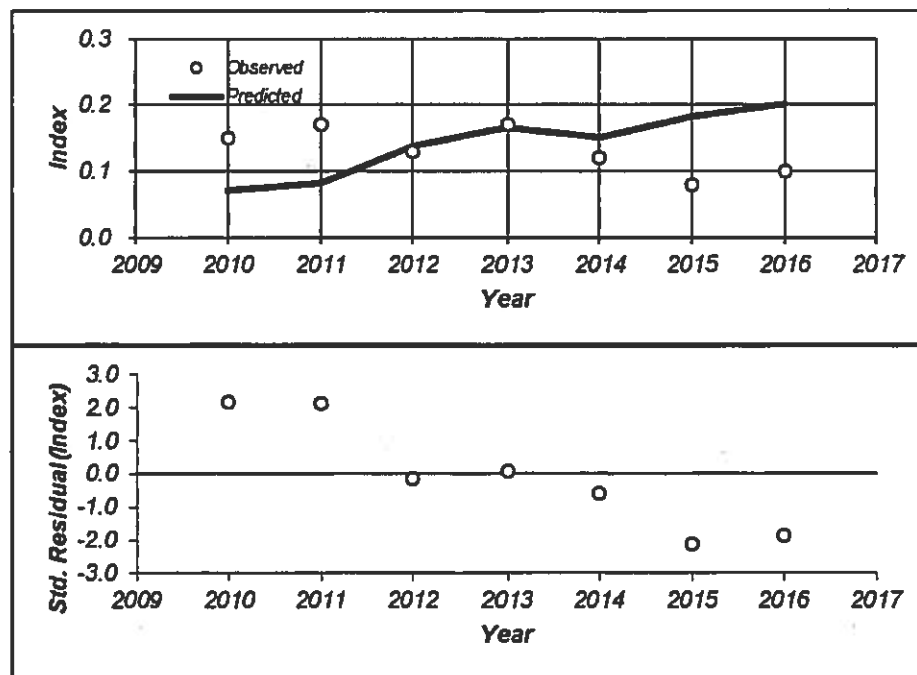


Figure 7: Annual input (open circles) and ASAP estimated (bold lines) commercial harvest age compositions.

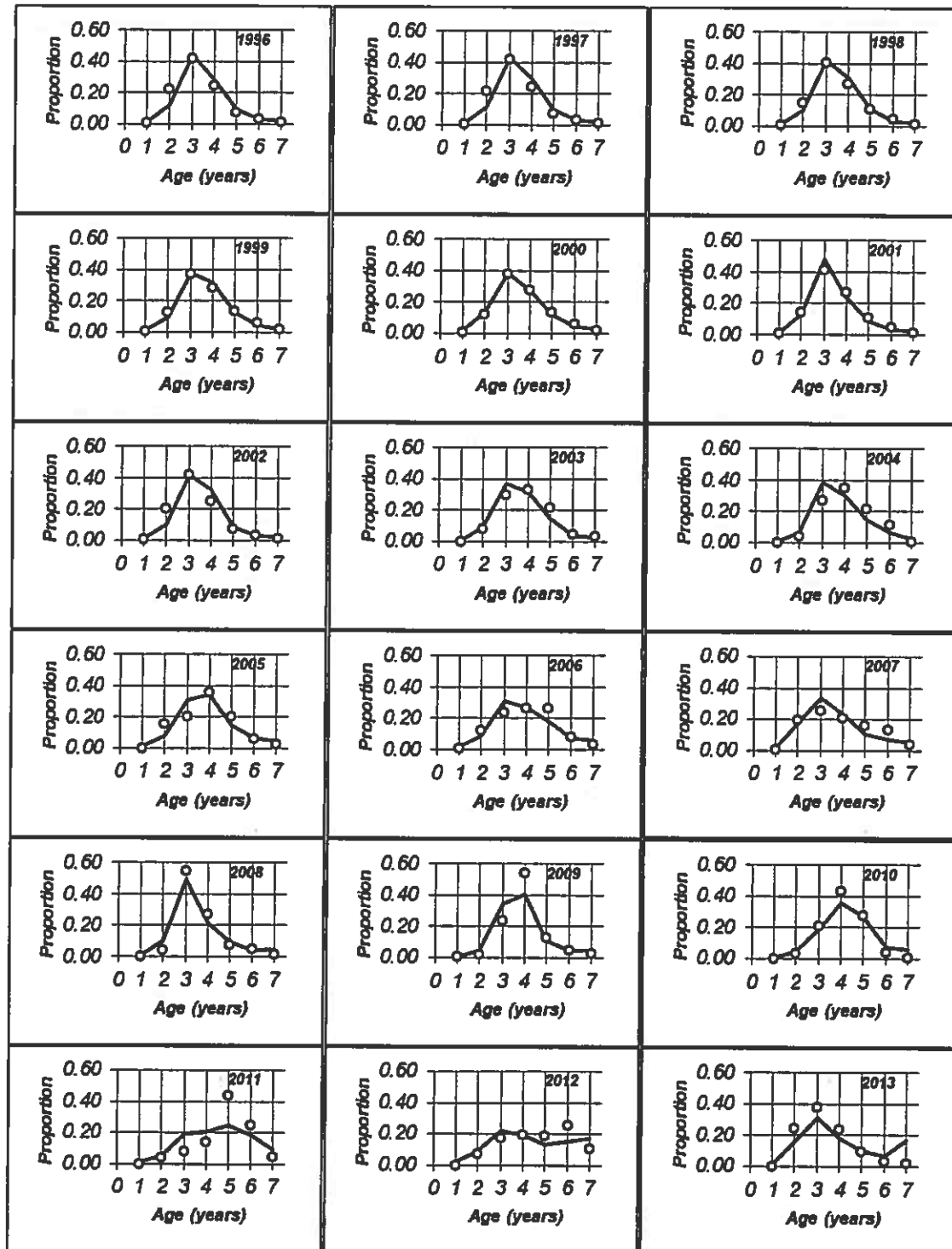


Figure 7 (continued):

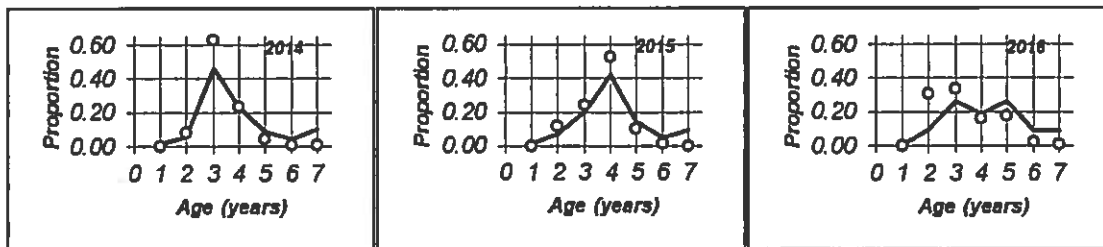


Figure 8: Annual input (open circles) and ASAP estimated (bold lines) survey age compositions of the "old" time-series.

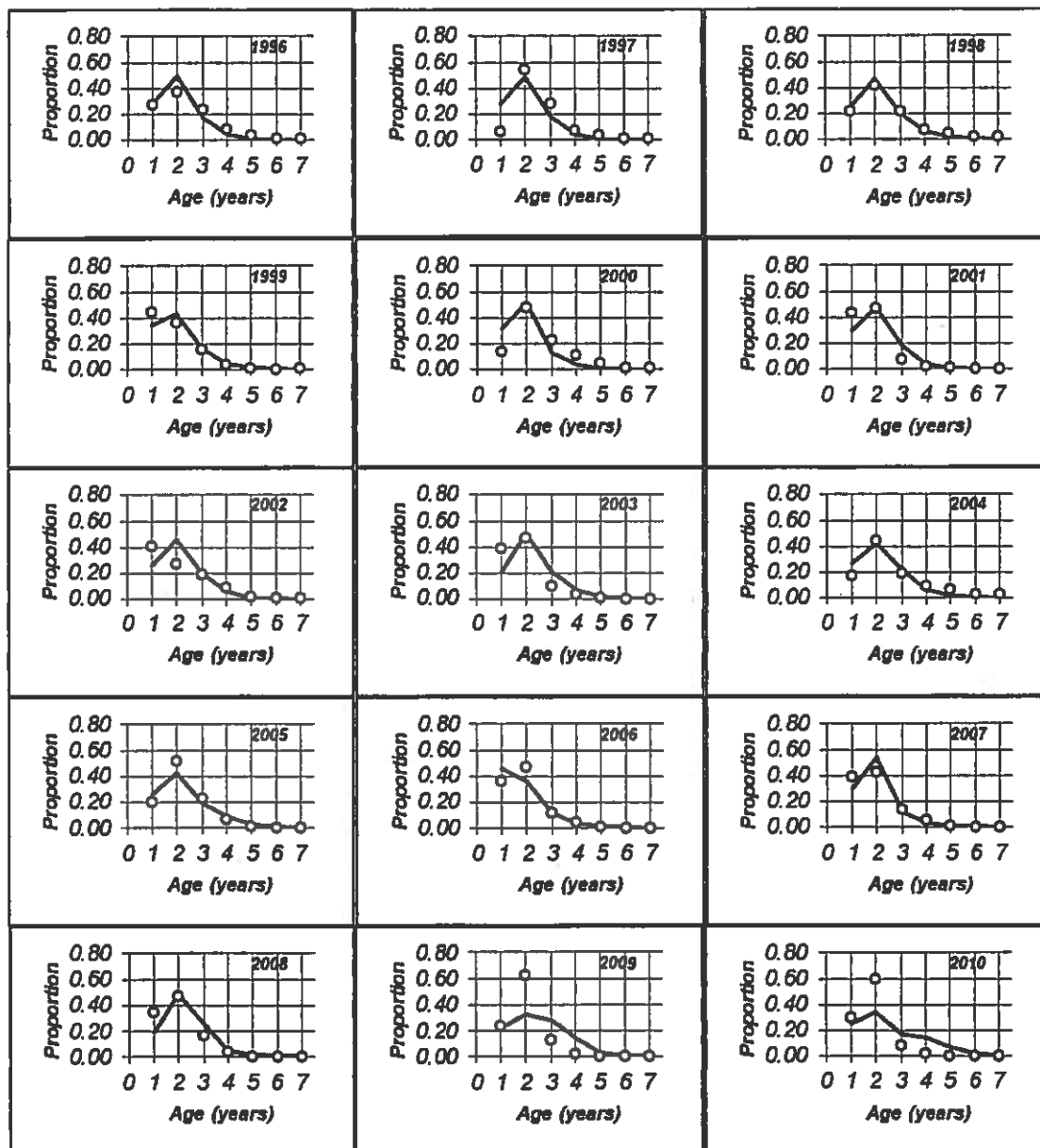


Figure 8 (continued):

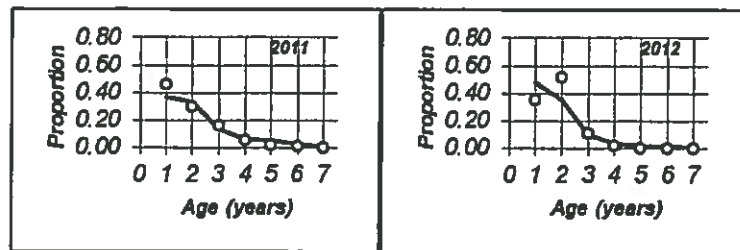


Figure 9: Annual input (open circles) and ASAP estimated (bold lines) survey age compositions of the “new” time-series.

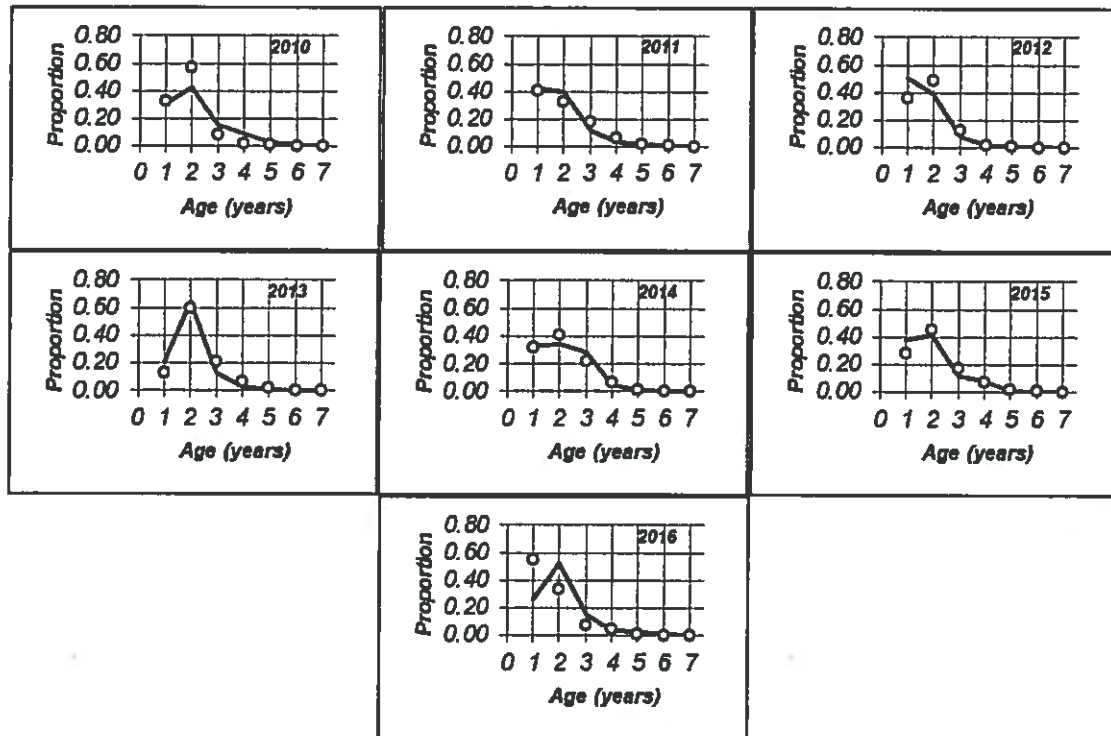


Figure 10: ASAP base model estimated fleet and survey selectivities (females only; ages 1-7+).

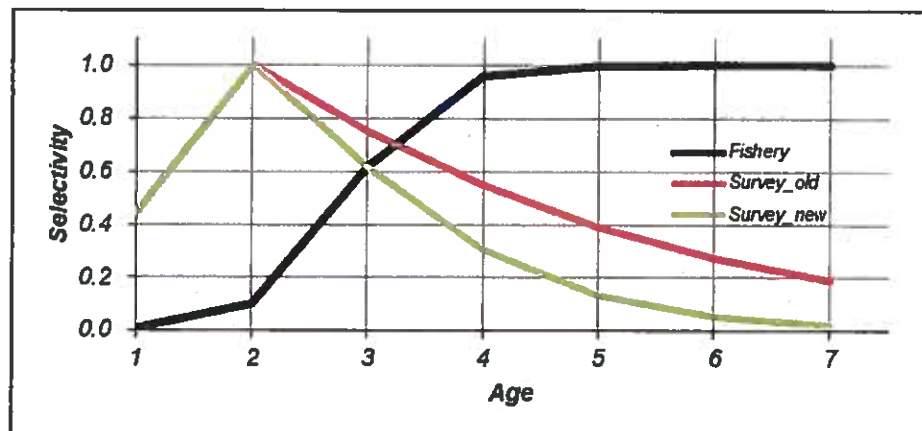


Figure 11: ASAP base model estimated recruitment (age-1 females). Dashed lines represent ± 1 asymptotic standard errors.

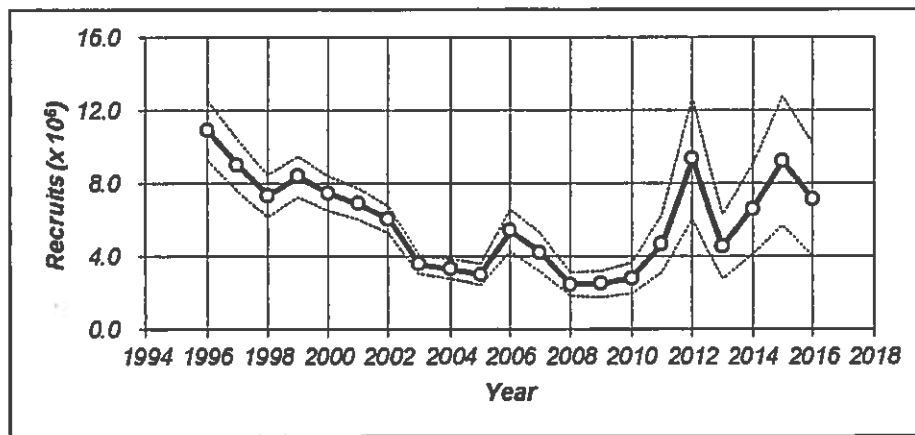


Figure 12: ASAP base model estimated egg production (MCMC median). Dashed lines represent 95% MCMC derived confidence intervals.

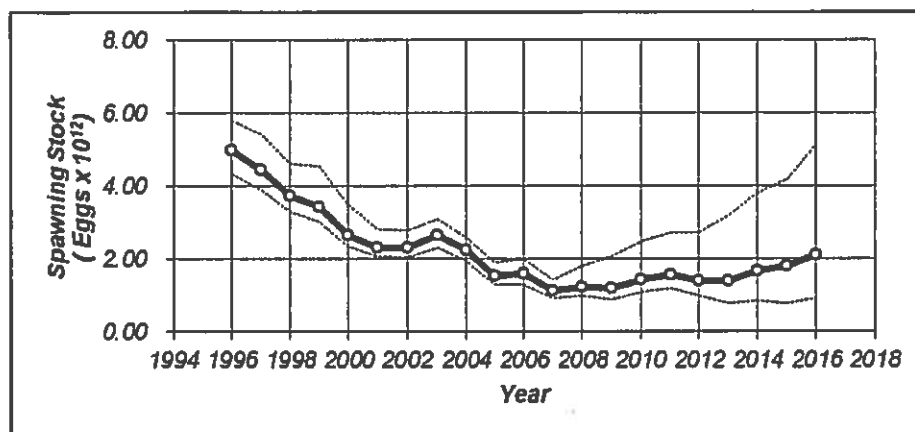


Figure 13: ASAP base model estimated average fishing mortality (MCMC median). Dashed lines represent 95% MCMC derived confidence intervals.

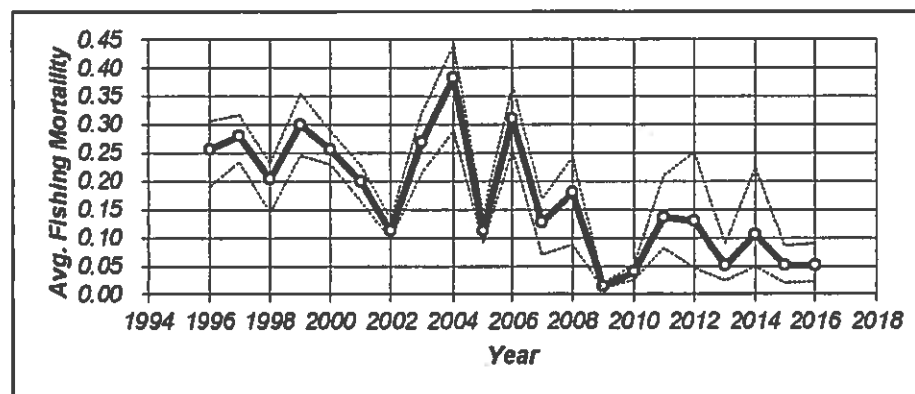


Figure 14: ASAP base model estimated age-1 recruits and spawning stock (total egg production). Arrows represent direction of the time-series. The yellow circle represents the most current data pair.

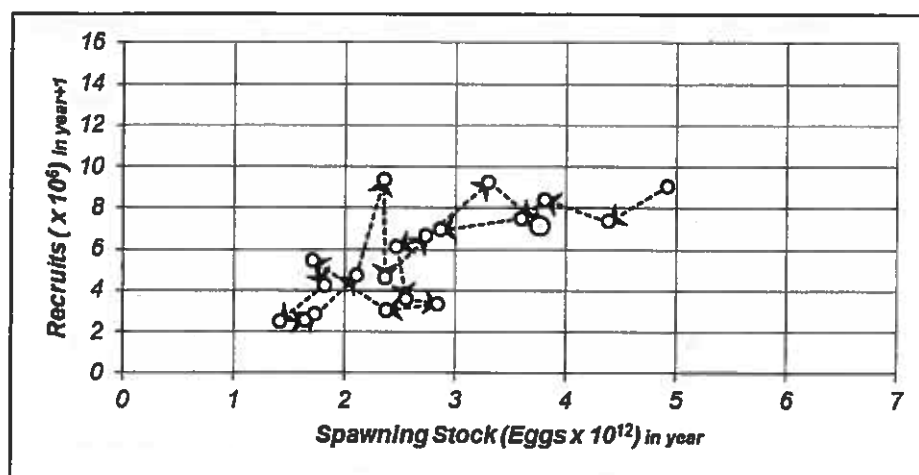


Figure 15: ASAP base model estimated age-1 recruits and spawning stock (open circles). Equilibrium recruitment is represented by the bold horizontal. The 2016 egg production estimate is represented by the yellow triangle. Equilibrium recruitment per spawning stock corresponding with the minimum and maximum spawning stock estimates are represented by the slopes of the dashed diagonals (min. spawning stock=19%SPR; max. spawning stock=66%SPR).

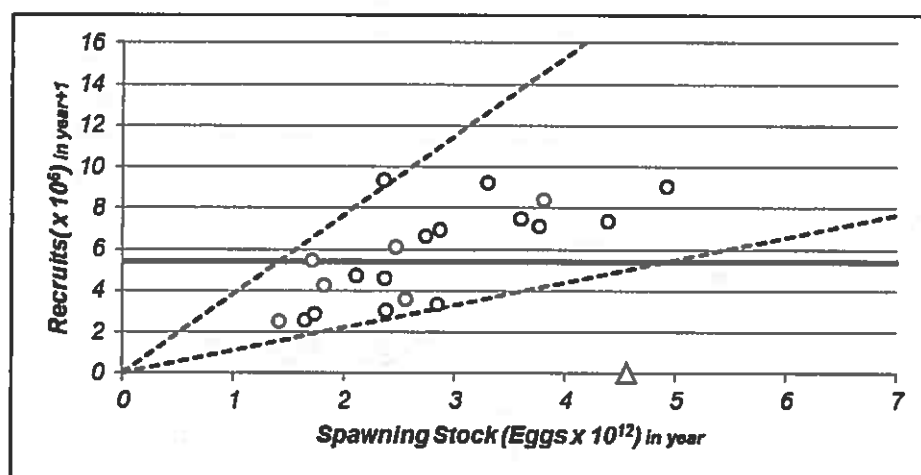


Figure 16: Retrospective analysis of ASAP base model. Top graphics depict estimated ratios of annual average fishing mortality to $F_{30\%}$ and spawning stock (egg production) to $SS_{30\%}$. Bottom graphic depicts estimated age-1 recruits.

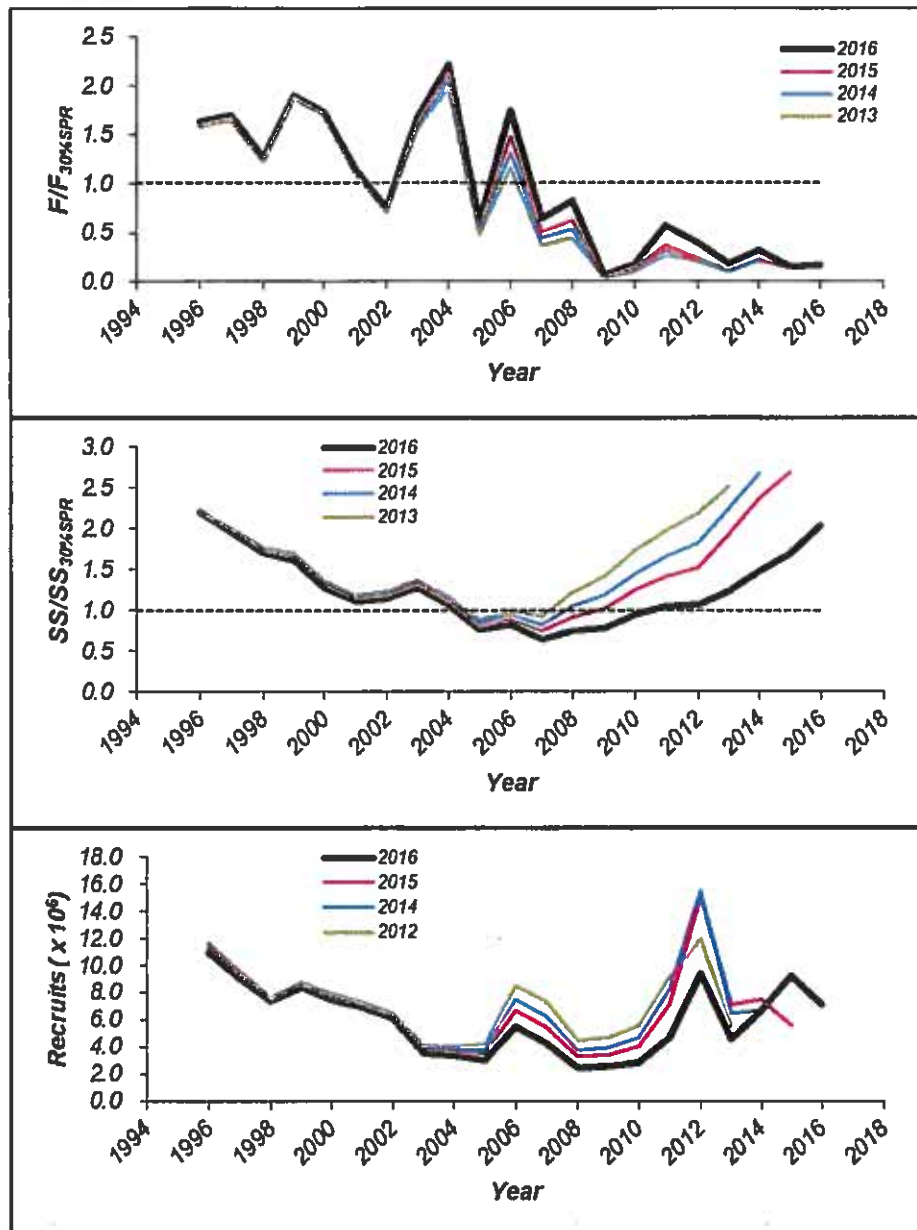


Figure 17: ASAP base model estimated ratios of annual average fishing mortality rates to $F_{30\%}$ and spawning stock size to $SS_{30\%}$. Arrows and dashed line represent direction of time-series (top graphic). The yellow circle represents current status (geometric mean 2014-2016 F and SS). Bottom graphic depicts results of 2000 MCMC runs relative to limit reference points and current stock status.

